

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

MATHEMATICA

Policy Research, Inc.

Contract No.: 53-3198-8-63
MPR Reference No.: 7826-210

FINAL REPORT

**REPORT ON DESCRIPTION OF STATE
PROGRAMS: STUDY OF SAVINGS IN
MEDICAID AND INDIGENT CARE FOR
NEWBORNS FROM PARTICIPATION
IN THE WIC PROGRAM**

April 26, 1990

Author:

Linda Bilheimer

Prepared for:

U.S. Department of Agriculture
Food and Nutrition Service
3101 Park Center Drive
2nd Floor
Alexandria, VA 22302

Project Officer:

Marian Lewin

Prepared by:

Mathematica Policy Research, Inc.
600 Maryland Avenue, S.W.
Suite 550
Washington, D.C. 20024

Co-Principal Investigators:

Barbara Devaney
Linda Bilheimer

CONTENTS

<u>Chapter</u>	<u>Page</u>
EXECUTIVE SUMMARY	ix
I. OVERVIEW	1
A. BASIC STUDY DESIGN	3
B. OUTLINE OF THE REPORT	6
II. ADVERSE PERINATAL OUTCOMES	9
A. TRENDS IN ADVERSE PERINATAL OUTCOMES IN THE U.S.	9
B. RACIAL DIFFERENCES IN PERINATAL OUTCOMES	11
C. ADVERSE PREGNANCY OUTCOMES IN THE STUDY STATES	12
D. FACTORS CONTRIBUTING TO ADVERSE PREGNANCY OUTCOMES	17
E. SUMMARY	21
III. STRUCTURE AND OPERATION OF THE WIC PROGRAM	25
A. FEDERAL REQUIREMENTS FOR THE WIC PROGRAM	26
B. STRUCTURE AND OPERATION OF THE WIC PROGRAM IN THE STUDY STATES	30
1. Size of the WIC Program	32
2. Role of State and Local Agencies	32
3. Availability and Accessibility of WIC Services	33
4. WIC Program Costs	36
C. SUMMARY	37
IV. STRUCTURE AND OPERATIONS OF THE MEDICAID PROGRAM	39
A. RECENT LEGISLATIVE HISTORY	40
B. CHARACTERISTICS OF THE MEDICAID PROGRAM IN THE STUDY STATES	42
1. Medicaid Financing	47
2. Medicaid Eligibility for Pregnant Women and Infants	48
3. Service Limits Affecting Pregnant Women and Children	51
4. Provider Reimbursement	52

CONTENTS (continued)

<u>Chapter</u>	<u>Page</u>
IV. (continued)	
5. HMO Participation	58
6. Special Program Initiatives for Pregnant Women and Infants	59
C. SUMMARY	61
V. OTHER PROGRAMS FOR PREGNANT WOMEN AND INFANTS	63
A. MATERNAL AND CHILD HEALTH SERVICES	65
B. HANDICAPPED CHILDREN'S SERVICES	68
C. STATE-FUNDED MEDICAL CARE FINANCING PROGRAMS	69
D. OTHER SPECIAL PROGRAMS FOR PREGNANT WOMEN AND INFANTS	70
E. DISCUSSION	73
VI. CONCLUSIONS	75
REFERENCES	77
APPENDIX	

TABLES

Table		Page
II.1	BIRTH CHARACTERISTICS; U.S. AND STUDY STATES	13
II.2	PERINATAL RISK FACTORS: U.S. AND STUDY STATES	19
II.3	BIRTHS BY HISPANIC ORIGIN OF MOTHER, 1987	22
III.1	WIC NUTRITIONAL RISK PRIORITIES	28
III.2	CHARACTERISTICS OF THE WIC PROGRAM IN THE STUDY STATES	31
IV.1	CHARACTERISTICS OF THE MEDICAID PROGRAM IN THE STUDY STATES	43
V.1	CHARACTERISTICS OF OTHER PROGRAMS FOR PREGNANT WOMEN AND INFANTS IN THE STUDY STATES	66

FIGURES

Figure	Page
II.1 INFANT MORTALITY RATES, ALL RACES, 1978-1986, PARTICIPATING STATES	14

EXECUTIVE SUMMARY

In 1987, the U.S. Congress mandated that the Secretary of Agriculture conduct a study to assess the savings in Medicaid and state indigent care costs for the care of women and newborns in the first sixty days after birth, which result from prenatal participation in the WIC program. The study, which is being performed by Mathematica Policy Research, Inc., explores the relationship between prenatal WIC participation and maternal and infant Medicaid expenditures in five states: Minnesota, North Carolina, South Carolina, Florida, and Texas. This report provides background information on the WIC, Medicaid, and indigent health care programs in the five participating states.

OVERVIEW

Chapter I of the report provides a brief overview of the project and the basic study design. To meet the study objectives, three key challenges must be met: database construction, development and estimation of an analytic model of Medicaid and indigent care costs, and generalization of the study findings to a national context. It is the third of these challenges which is the major focus of this report. In order to generalize the study results from the five participating states, knowledge of the sociodemographic characteristics of these states, and of the operational features of their WIC, Medicaid, and indigent care programs, is essential.

ADVERSE PERINATAL OUTCOMES

Analyses exploring the effectiveness of prenatal WIC participation in improving pregnancy outcomes must take into account the differences in perinatal risk factors between participants and non-participants. Knowledge of perinatal risk factors is also important for interpreting apparent differences in WIC benefit/cost ratios across states. Trends in adverse perinatal outcomes and perinatal risk factors in the U.S. and the five study states are reviewed in Chapter II.

Nationwide, the dramatic infant mortality declines of the 1970s resulted more from increased rates of survival among very low birthweight infants than from improvements in the birthweight distribution. Recently the rate of decline in the infant mortality rate has slowed considerably and further dramatic reductions are unlikely to occur without improvements in the birthweight distribution. Important risk factors affecting birth outcomes include socioeconomic status, race, maternal age, maternal marital status, and prenatal care adequacy. Major differences in the distributions of these risk factors exist among the five study states. Minnesota is a wealthy state, with a small minority population, and birth outcomes that compare very favorably with the other states. In contrast, the three southeastern states--North Carolina, South Carolina, and Florida--all have large black populations and relatively high infant mortality rates. Texas' infant mortality rates are relatively low even though its rates of early prenatal care enrollment are among the lowest in the country. This apparent inconsistency is probably due to the large Hispanic population in Texas; Hispanic women have typically had much lower rates of prenatal care participation than women of other ethnic origins.

STRUCTURE AND OPERATION OF THE WIC PROGRAM

Chapter III describes the structure and operation of the WIC program, nationwide and in the five study states. The WIC program is administered in each state by the designated state agency under federal guidelines. Interstate variation in program operations is limited by the specificity of the federal regulations, which are designed to ensure that the goals of the WIC program are met effectively and efficiently. Federal regulations affect program eligibility, services received, and program costs. Nonetheless, great differences in program operations occur at the local level, over which the state agencies exert varying amounts of control. An important factor affecting the degree of state control is whether local WIC agencies are arms of the state, as in South Carolina and Florida, or autonomous agencies, as in Minnesota, North Carolina, and Texas. (A mixed system exists in Texas; most local agencies are autonomous, but there are also seven state-operated WIC centers.)

Since WIC is not an entitlement program, the total number of participants in a state is a function of the size of the WIC grant (plus any state appropriations for WIC). Caseload management is used when the demand for WIC services is greater than the number of caseload slots available. This may mean not serving all six WIC priority categories and/or the use of waiting lists. Among the study states, only South Carolina was serving all six WIC priority categories on a statewide basis during the study period. Minnesota and South Carolina were the only states using waiting lists, although efforts were made to ensure that pregnant women were not placed on waiting lists.

The factors that affect WIC program participation rates, including the availability of public prenatal care and the accessibility of WIC services, vary within and among the study states. These differences have important implications for the WIC/Medicaid study in which a major analytical issue is modeling the WIC participation decision. In North Carolina, bottlenecks in the public prenatal care system impede access to WIC services for pregnant women. Long delays in getting appointments for WIC services were also cited in Texas and Dade County, Florida. In addition, Texas had 34 unserved counties during the study period. All five study states are experiencing rapid growth in the number of WIC participants as a result of infant formula rebate programs.

STRUCTURE AND OPERATION OF THE MEDICAID PROGRAM

Assessing the impact of WIC prenatal participation upon Medicaid costs is complicated by the many differences that exist between states' Medicaid programs, and by the ongoing changes and expansions in Medicaid coverage for pregnant women and infants. As states have adopted the Congressionally authorized options and mandates, participation incentives for both providers and recipients have changed, along with eligibility criteria and provider reimbursement. In addition, Medicaid program expansions in some states have included enhanced program coordination and referral for low-income pregnant women, possibly influencing WIC participation.

Chapter IV reviews the characteristics of the Medicaid programs in the study states, identifying changes that occurred during the period of the study and subsequently. Prior to the eligibility expansions for pregnant women and infants, which were authorized under the Omnibus Budget Reconciliation Act of 1986 (OBRA-86) and implemented by South Carolina, North Carolina, and Florida in the last quarter of 1987, only Minnesota had a relatively high Medicaid income eligibility standard. In the other four states, a pregnant woman had to have a family income level below fifty percent of the poverty level in order to qualify for Medicaid. In Texas,

the income eligibility level for pregnant women was one-third of the poverty level. Variation in Medicaid income-eligibility levels across the states may have a major effect upon the empirical study results. Subsequently, four of the five states--Florida, Minnesota, South Carolina, and Texas--have implemented Medicaid expansions for pregnant women and infants that were authorized under the Omnibus Budget Reconciliation Act of 1987 (OBRA-87), raising the income eligibility standard for pregnant women and infants above the federal poverty standard.

All five states in the study have low Medicaid reimbursement rates relative to prevailing community charges, although they have all raised physician reimbursement rates for deliveries in conjunction with the eligibility expansions for pregnant women and infants. Reimbursement methods for both hospitals and physicians differ among the study states, possibly affecting provider incentives and Medicaid costs for pregnant women and infants. Texas, South Carolina, and Minnesota all reimburse hospitals using diagnosis-related groups, while North Carolina and Florida use hospital-specific per diem rates. During the study period, Minnesota, North Carolina, South Carolina and Florida all permitted physicians to use global or individual visit billing for maternity services, although each state had different requirements and specifications for global billing. In Texas, only global billing was allowed at the time of the study. (Subsequently, both Texas and South Carolina have abolished global billing.) In addition to these differences in reimbursement methods, Texas and Florida had service limitations in effect during the study period, which may have limited Medicaid expenditures for high-cost newborns.

In many states, the opportunities afforded by the OBRA-86 and OBRA-87 initiatives have served as a catalyst for the development of a broad range of program interventions for pregnant women and infants. Florida, Minnesota, North Carolina, and South Carolina have all developed Medicaid-related perinatal programs to provide enhanced perinatal services to pregnant women and newborns, with special emphasis upon the needs of high-risk women. However, only South Carolina's program, which was implemented prior to 1987, is likely to have an impact upon the WIC/Medicaid study results.

OTHER PROGRAMS FOR PREGNANT WOMEN AND INFANTS

The Congressional mandate for this study requested that the benefits of WIC prenatal participation be analyzed in terms of both Medicaid and indigent care costs for pregnant women and newborns. Chapter V reviews programs and options for low-income women in the study states, focusing primarily on Title V Maternal and Child Health Services and Handicapped Children's Services, state-funded medical care financing programs, and other special programs for pregnant women and infants. The role of these programs is changing rapidly as Medicaid coverage for pregnant women and infants expands. States that have been using state and local funds to pay for medical care for low-income pregnant women and newborns can obtain a far greater return on these dollars by using them to finance Medicaid expansions. Thus, in all the study states, the Medicaid program is subsuming indigent care programs for pregnant women and infants.

CONCLUSIONS

Chapter VI briefly summarizes the conclusions of the report, pointing out the striking contrasts that exist between the study states, both in terms of program structures and in terms of pregnancy outcomes. The WIC program plays a pivotal role in the maternal and child health

activities of all five states, but the degree of state control over WIC activities varies considerably, as do WIC participation rates. Medicaid programs in all the study states have been changing rapidly over the last couple of years, as the states implement new initiatives for pregnant women and infants. Other government programs for pregnant women and infants are now being reassessed as more pregnant women become eligible for Medicaid. The future role for government agencies in the direct provision of care will depend, to a considerable extent, on the private sector's response to the new Medicaid enhancements.

I. OVERVIEW

High rates of low birthweight and infant mortality, and the corresponding problem of inadequate prenatal care for low income pregnant women, are major public health policy concerns in the United States. In recent years, these concerns have caused Congress to increase federal funding for programs to enhance health service access for low-income pregnant women and children, and to place additional responsibilities on the states to expand services for these very vulnerable populations. Recognizing the importance of good nutrition for pregnant women and infants, the federally supported Special Supplemental Food Program for Women, Infants, and Children (WIC) has grown significantly in the 1980s. In addition, beginning in 1984, Congress has authorized a series of expansions in the Medicaid program targeted to pregnant women and children.

The WIC Program, authorized by Congress in 1972, provides nutritional risk assessments, food assistance, nutrition education, and health and social service referrals for low-income pregnant and postpartum women and their infants, and children up to age five. The major goal of WIC prenatal nutrition supplementation and education is to improve the nutritional status of low-income pregnant women. The program, which is federally funded and administered by state and local agencies, has become a major component of state and local maternal and child health services. Nationwide, WIC has grown from a \$750 million program serving 2 million women and children in 1980 to an estimated \$2.1 billion program serving 4.4 million women and children in 1990.

The Medicaid Program, enacted as part of the Social Security Act Amendments of 1965, is a Federal and State funded entitlement program that pays for medical care for certain groups of low-income people. Concern about the inadequacy of financing for maternity care for low-income pregnant women—many of whom lacked any form of medical insurance, public or private—

led Congress to expand Medicaid coverage for low-income pregnant women and infants in the 1980s. New initiatives included the elimination of categorical eligibility requirements, raising income eligibility ceilings, easing resource restrictions, simplification of the eligibility process, and service enhancements. Since the first program expansions were enacted in 1984, Medicaid has assumed a much greater role in the financing of maternal and newborn care and, in many instances, is now supplanting state and locally funded programs for indigent pregnant women. The number of low-income pregnant women and infants who are Medicaid-eligible will probably continue to grow as new federally authorized options and mandates come into effect.

With the growth of federal expenditures for both WIC and Medicaid, and the overlap in the populations of pregnant women and infants served by these programs, an important question is whether prenatal participation in the WIC program affects the subsequent health care costs of Medicaid-eligible women and their newborns. If WIC participation during pregnancy improves birth outcomes, then lower Medicaid and state indigent care expenditures in the neonatal period may offset the costs of the WIC program. Thus, in 1987, Congress mandated that the Secretary of Agriculture conduct a study to assess the savings in Medicaid and state indigent care costs for the care of women and newborns in the first sixty days after birth resulting from the mother's prenatal participation in the WIC program. The results of this study are to be presented in a report to Congress in 1990. This study, which is being performed by Mathematica Policy Research (MPR), will explore the relationship between WIC prenatal participation and maternal and infant Medicaid expenditures in five states: Minnesota, North Carolina, South Carolina, Florida, and Texas.

The purpose of this report is to provide the critical background information on state programs which is essential for the interpretation and generalization of the study results. Thus, the report focuses on the key similarities and differences in sociodemographic characteristics and program operations among the participating states, and between these states and the rest of the

country. The remainder of this chapter reviews the basic study design and provides an outline of the report.

A. BASIC STUDY DESIGN

The objective of the WIC/Medicaid study is to determine how the Medicaid and indigent health care costs of mothers and their infants at birth and during the first sixty day period after birth are affected by maternal prenatal WIC participation. This will be accomplished through extensive analysis of WIC, Medicaid, and vital statistics data in the study states. To meet the study objective, three key challenges must be met:

1. Construction of a database for each state that entails the complex linking of data on Medicaid and indigent care costs, WIC participation and costs, and maternal and newborn characteristics
2. Development and estimation of an analytic model of Medicaid and indigent care costs that is able to isolate the effect of WIC prenatal participation from other measured and unmeasured maternal characteristics on health care costs
3. Generalization of the findings from this study to a national context

The first challenge relates to the construction of the database to use in the empirical analysis. In each of the five study states, the analysis database will be constructed from at least three separate data files:

1. Medicaid files, which provide Medicaid cost and eligibility data on newborns and their mothers
2. Birth, infant death, and fetal death files, which provide data on maternal characteristics, birthweight, and other newborn characteristics, and infant and fetal deaths
3. WIC program files, which serve to identify the Medicaid mothers as either WIC participants or nonparticipants and to provide WIC cost data for the participants

These three data files will be linked to create a sample of Medicaid birth records in a given time period that consist of data on Medicaid costs, WIC participation status and costs, birthweight and other pregnancy outcomes, and maternal characteristics, such as age, race, birth parity, education, marital status, and previous obstetrical history. A detailed description of the design of the database and file construction process is contained in the database feasibility report (Burghardt et al., 1990).

The second challenge is to develop an accurate measure of the Medicaid costs that WIC participants would have incurred had they not participated in WIC. This is not a simple analytical problem because, in addition to WIC participation, WIC participants and nonparticipants may differ in terms of other characteristics that affect perinatal outcomes and Medicaid costs. These factors include demographic, medical, behavioral, and environmental risks, all of which will vary across the study states. Thus, one purpose of this report is to describe the sociodemographic differences between the study states that may influence birth outcomes. The actual methodological approach to be used in the analysis is the topic of another feasibility report (Devaney et al., 1989).

The third challenge, and the one that primarily motivates this report, is to draw national policy inferences from a sample of five non-randomly selected states. Ideally, the dataset used for an analysis of the impact of WIC prenatal participation on Medicaid costs in the first sixty days of life would be a large, nationally representative sample of Medicaid births. However, this approach is infeasible, given the nature of the data and the resources available. In lieu of this, five states have been selected to participate in the study. The selection of the five states is one product of an extensive feasibility study involving site visits to seven possible participant states and a thorough review of their programs and data systems. Based on this review, five of the seven states in the feasibility study were selected to participate. The states were selected because their data systems are capable of generating extracts from each of the main data sources relatively

easily, their systems contain sufficient data to link files across systems, and their state officials have been willing to devote some of their own efforts and staff resources to the project.

Analysis based on WIC, Medicaid, and vital statistics data from the five study states will lead to state-specific benefit/cost estimates. These estimates will, inevitably, differ since the selected states have different demographic and institutional structures and face different problems in ensuring access to care for low-income pregnant women and children. In addition, while every attempt will be made to ensure that the databases and analysis methodologies are as similar as possible across the study states, differences will inevitably arise. Notwithstanding these differences between the states, in order to assess the overall cost effectiveness of WIC prenatal participation, generalization of the state-specific results to the nation as a whole is required. This is complicated by the fact that the selected states are not a representative sample, four of the five being southern. Knowledge of interstate and intrastate sociodemographic variations is important because of the profound influence of sociodemographic characteristics on perinatal outcomes. In general, women who are black, low-income, unmarried, under 18, or over 35 are at greater risk for having low birthweight infants. To a significant extent, birth outcome differences both within and between states can be accounted for by different risk group distributions of births. Hence, in order to be able to generalize the results, an understanding of their sociodemographic characteristics of the study states is essential.

In addition to differences in the populations at risk, programmatic differences play a major role in determining who is eligible for WIC and Medicaid services, the services that are available through Medicaid, Medicaid reimbursement amounts, program participation rates, and other service options for low-income pregnant women and newborns. Thus, simple interstate program cost and utilization comparisons can be highly misleading unless adjustments are made for these structural variations.

II. ADVERSE PERINATAL OUTCOMES

In order to evaluate the costs and benefits of a prenatal nutrition program such as WIC, and to understand the program's potential role in preventing adverse perinatal outcomes, knowledge of the factors that affect perinatal outcomes is essential. Analyses exploring the effectiveness of prenatal WIC participation must take into account variations in known perinatal risk factors among program participants and nonparticipants. The WIC/Medicaid study, moreover, will be using program data from five states in order to draw inferences about the benefits and costs of the WIC program. Marked differences exist in the rates of adverse perinatal outcomes among these states which, to a large extent, reflect variations in perinatal risk factors. Thus, apparent differences in WIC benefit/cost ratios across the states may be partially attributable to differences in the risk factors affecting their birth outcomes.

In this chapter, trends in adverse perinatal outcomes in the U.S. and the five study states are reviewed, overall and on a race-specific basis. Risk factors for adverse perinatal outcomes are then discussed, highlighting the contrast among the study states.

A. TRENDS IN ADVERSE PERINATAL OUTCOMES IN THE U.S.

The first half of this century witnessed a dramatic decline in infant mortality rates in the United States. The infant mortality rate fell from approximately 100 infant deaths per 1000 live births in 1900 to 29 infant deaths per 1000 live births in 1950. A significant part of this reduction was due to a decline in postneonatal deaths (Kleinman and Kessel, 1980), for which environmental, hygiene, and nutrition improvements were largely responsible.¹ Another contributing factor was the development of antimicrobial drugs in the 1930s and 1940s which reduced the risks of infectious illness in early childhood.

¹Postneonatal deaths are deaths to infants aged from 28 days to one year.

Infant mortality rates stabilized in the 1950s and early 1960s, before going through another period of rapid decline from the mid-1960s to the end of the 1970s. Between 1970 and 1980 the U.S. infant mortality rate fell by 37 percent. This time, however, 89 percent of the reduction was due to declines in neonatal mortality (National Center for Health Statistics, 1988).² Furthermore, it is readily apparent that the improvement in neonatal mortality in the 1970s was primarily technology driven; the development of neonatal intensive care plus the increased use of Cesarean sections greatly increased the probability of survival for low birthweight infants, especially those in the 1,000 to 2,500 gram range (Kleinman and Kessel, 1980; Williams and Chen, 1982).

Low birthweight (less than 2,500 grams) is the single most important risk factor for infant death, but there has been very little improvement in the U.S. birthweight distribution in recent years. While the infant mortality rate fell by 43 percent between 1965 and 1977, the low birthweight rate declined by only 14 percent in the same period. In the 1980s there was virtually no change in the proportion of low weight births, and the very low birthweight rate (<1500 grams) actually increased. This was probably due, in part, to the increase in survival of very low birthweight infants that, in previous decades, would have been stillborn.³

Health professionals recognize that further improvements in the U.S. infant mortality rate, which declined only slightly in the 1980s and now appears to have reached a plateau, can only be accomplished by improvements in the birthweight distribution. The reductions in infant mortality in the 1970s were accomplished at high cost by reductions in birthweight-specific

²Neonatal deaths are deaths of infants aged less than 28 days.

³This is borne out by the available data on fetal deaths. Trends in fetal deaths are difficult to track, because of the lack of consistent definitions and reporting requirements across the states. Therefore, reported rates must be treated cautiously. However, given this caveat, reported fetal deaths showed a slight decline in the 1970s; the fetal death rate fell from an annual average of 12.0 per 1000 live births plus fetal deaths in 1972-1974 to 8.4 per 1000 in 1982-1984 (National Center for Health Statistics, 1986).

mortality rates; the next major breakthrough can only come through the prevention of low birthweight and prematurity. This underscores the importance of programs such as WIC, which is intended to improve birth outcomes through nutritional supplementation and nutrition education during pregnancy.

B. RACIAL DIFFERENCES IN PERINATAL OUTCOMES

In spite of the large decline in the U.S. infant mortality rate in the 1960s and 1970s, the black infant mortality rate is still approximately twice as high as the white infant mortality rate. Between 1960 and 1980 the white infant mortality rate declined from 22.9 to 11.0 per 1000 live births, while the corresponding black rate declined from 44.3 to 21.4 per 1000 live births during the same period. The black /white ratio reached its lowest point during this period in 1971, when the ratio was 1.77. However, there is now increasing evidence that, far from closing the gap, the differential in black and white birth outcomes is growing. By 1986, the white infant mortality rate had fallen to 8.9 per 1000 live births, while the black infant mortality rate was still 18.0 per 1000 live births; this was the first time in over forty years that the black/white ratio was greater than 2.0 (Hughes et al., 1989).

The difference in black and white infant mortality rates is reflected in race-specific low birthweight rates which remain remarkably fixed over time. Overall low birthweight rates among blacks are approximately twice the corresponding white rates, and racial differences are even greater for very low birthweight rates. Thus, between 1970 and 1986, low birthweight rates declined from 6.8 percent to 5.6 percent among whites and from 13.9 percent to 12.5 percent among blacks. However, between 1979 and 1986, very low birthweight rates increased slightly from .90 percent to .93 percent among whites, while the corresponding rate among blacks rose from 2.37 percent to 2.66 percent. Thus, the black very low birthweight rate is now almost three times the corresponding white rate (Hughes et al., 1989).

The perplexing disparities in black and white birth outcomes are the focus of much public health policy concern and research. While the known risk factors for adverse pregnancy outcomes, discussed below, are more prevalent among black mothers, large racial differences in birthweight exist even among mothers at low risk. These differences are particularly striking for very low birthweight rates (Kleinman and Kessel, 1987). Similar racial disparities in birth outcomes are observed in most states.⁴ Consequently, states with similar race-specific low birthweight and infant mortality rates may have very different aggregate statistics because of the different racial compositions of their populations.

C. ADVERSE PREGNANCY OUTCOMES IN THE STUDY STATES

Although only five states are participating in the WIC/Medicaid study, the selected states accounted for 18 percent of all U.S. births in 1985. Given the national problem of racial disparities in birth outcomes, variations in rates of adverse perinatal outcomes among the study states would be anticipated. As shown in Table II.1, the three South Atlantic states have a relatively high proportion of births to black women, in contrast to Minnesota in which the proportion of births to black women is extremely small. Texas lies in between these two extremes, with a black birth proportion which is close to the national average.

Marked differences in infant mortality rates indeed exist among the study states, but these cannot be attributed solely to different demographic structures. Overall infant mortality rates in the study states are shown in Figure II.1, and are illustrated more extensively in the Appendix. The following infant mortality patterns are observed:

- **South Carolina.** On a race-specific basis, South Carolina has had high infant mortality rates relative to the other study states and to the rest of

⁴For the period 1982-84, 32 states plus the District of Columbia had at least 5000 white births and 5000 black births. Twenty-three of these had black/white infant mortality ratios in the range 1.75 - 2.25. Of the remainder, seven had ratios below 1.75 and three had ratios above 2.25. (Source: National Center for Health Statistics, 1986.)

TABLE II.1
BIRTH CHARACTERISTICS: U.S. AND STUDY STATES
1987

	Total Births	Racial Distribution			Percent Low Birthweight ¹		
		Percent White	Percent Black	Percent Other	All ²	White	Black
U.S.	3,809,394	78.6	16.8	4.6	6.9	5.7	12.7
Florida	175,144	74.4	24.1	1.5	7.7	6.0	13.0
Minnesota	65,173	91.2	3.8	5.0	5.0	4.6	13.2
North Carolina	93,501	68.3	29.2	2.5	7.9	6.0	12.4
South Carolina	52,801	60.6	38.5	0.9	8.6	6.1	12.6
Texas	301,962	83.6	14.1	2.3	6.9	6.0	12.3

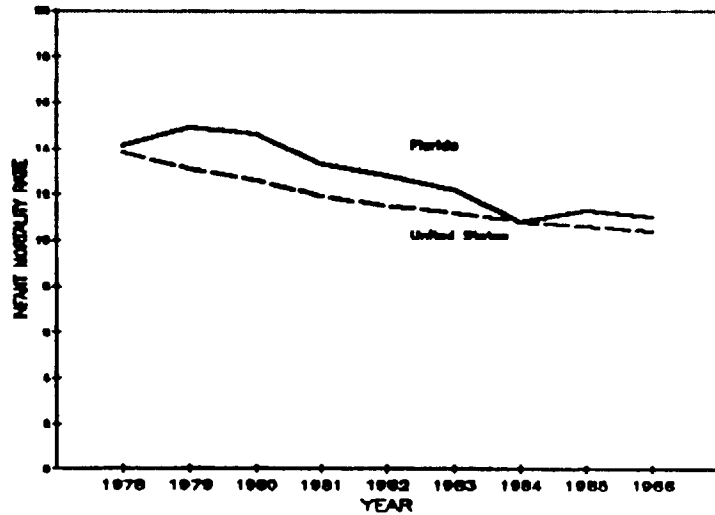
SOURCE: National Center for Health Statistics. Advance Report of Final Natality Statistics, Monthly Vital Statistics Report, vol. 36, no.4, July 1, 1987.

¹Less than 2500 grams.

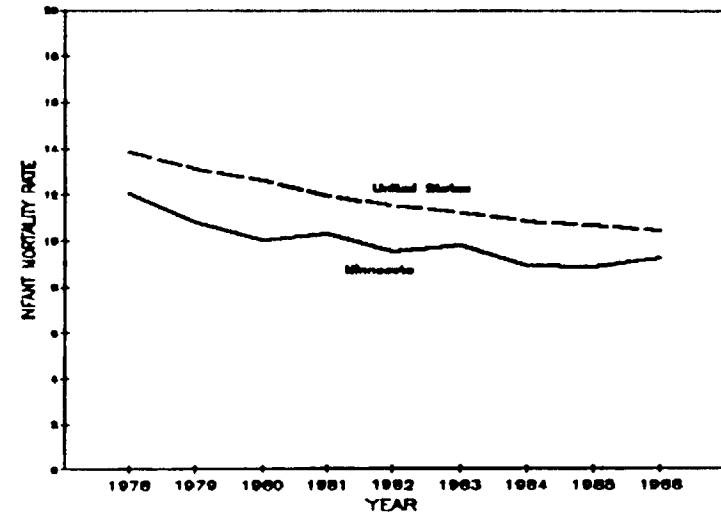
²Includes races other than white and black.

Infant Mortality Rates, All Races, 1978-1986,
Participating States

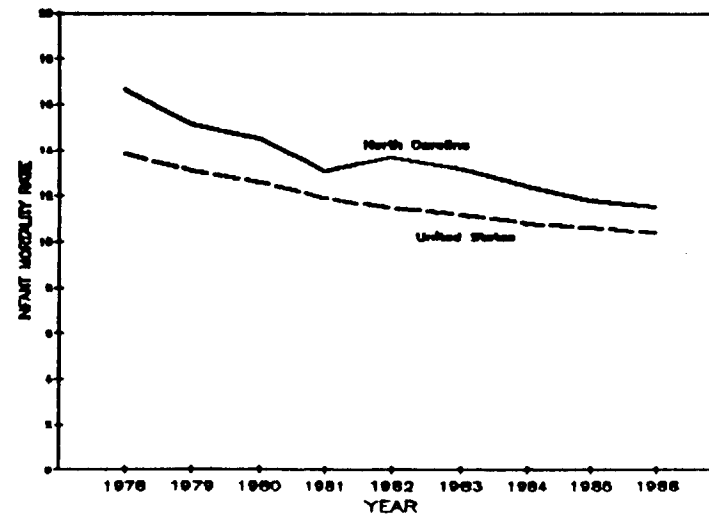
FLORIDA



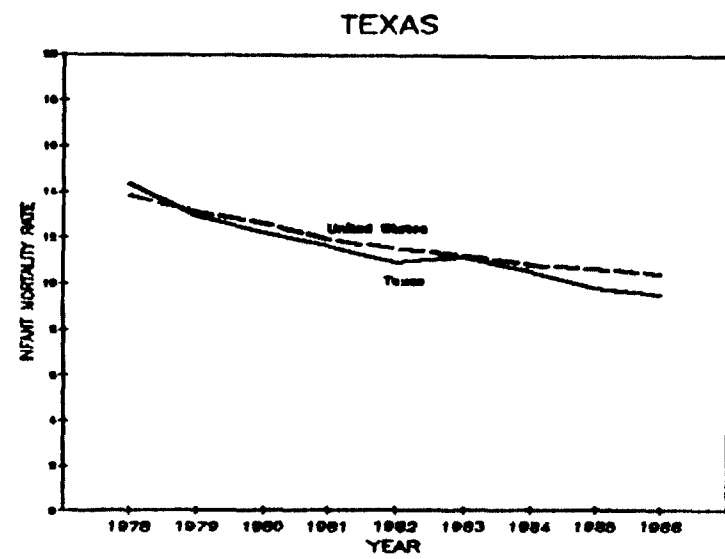
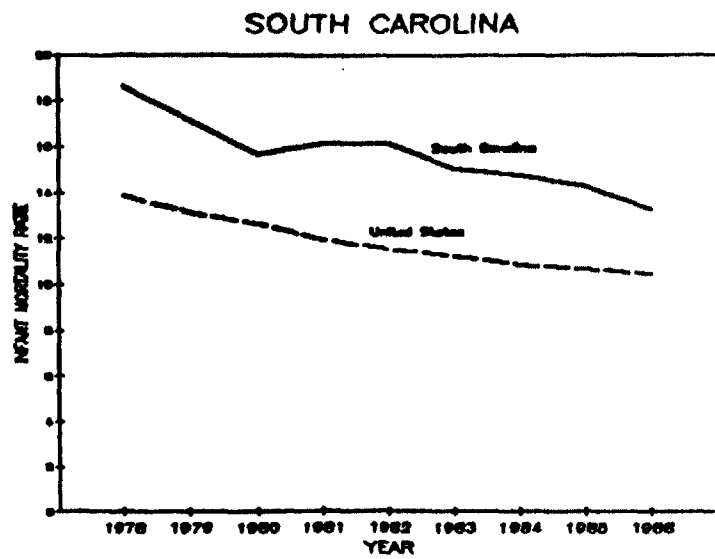
MINNESOTA



NORTH CAROLINA



Infant Mortality Rates, All Races, 1978-1986,
Participating States (continued)



the nation, reflecting high rates of both neonatal and postneonatal deaths.

- **North Carolina.** The overall infant mortality rate in North Carolina has also been higher than the national average and, in the past, this has reflected relatively high race-specific rates. More recently, however, North Carolina's race-specific rates have been very close to the corresponding U.S. averages.
- **Minnesota.** In contrast, the infant mortality rate in Minnesota has been consistently below the U.S. average, largely resulting from low neonatal mortality rates.
- **Texas.** In recent years, infant mortality rates in Texas have also been below the corresponding U.S. averages—overall and on a race-specific basis. However, it is not clear how the Texas mortality data should be interpreted since there may be significant underreporting of infant deaths, especially along the Mexican border.
- **Florida.** Although the overall infant mortality rate has typically been above the U.S. average in Florida, race-specific rates track the corresponding national averages closely. The only exception to this is the black postneonatal mortality rate which, historically, has been above the national average.

One might expect that the infant mortality rate differences among the study states would be reflected in their race-specific low birthweight rates which are shown in Table II.1. However, this is only the case in Minnesota where the white low birthweight rate has consistently been lower than the U.S. average.⁵ Race-specific low birthweight rates among the four southern states, however, are remarkably similar. Unlike Minnesota, all four states have white low birthweight rates that have been somewhat above the U.S. average for the last decade, although in Texas the rate has been only slightly elevated (Hughes et al. 1989). In contrast, Florida, North Carolina, and Texas have generally had black low birthweight rates that were close to, or somewhat below, the U.S. average, while South Carolina's rate has been close to, or somewhat

⁵The black low birthweight rate in Minnesota is very volatile on a year-to-year basis because of small numbers. Consequently, trends in annual rates can be misleading.

above, the U.S. average. (Although, as Table II.1 indicates, Florida's black low birthweight rate rose above the U.S. average in 1987 while South Carolina's rate fell below the U.S. average.)

D. FACTORS CONTRIBUTING TO ADVERSE PREGNANCY OUTCOMES

The Institute of Medicine (1985), in its landmark study on the prevention of low birthweight, classified the principal risk factors for low birthweight into six categories:

1. Demographic risks
2. Medical risks predating pregnancy
3. Medical risks in the current pregnancy
4. Behavioral and environmental risks
5. Health care risks
6. Evolving concepts of risk

Unfortunately, the data available for this study are not rich enough in detail to permit a cross-state comparison of all the risk factors included in these categories. However, in most states, the vital statistics database can provide the following individual-level information for all births:

- **Demographic risks:** unmarried; age (less than 17; over 34); race (black); low level of education
- **Medical risks predating pregnancy:** parity (0 or more than 4); other pregnancy terminations
- **Medical risks in current pregnancy:** multiple pregnancy
- **Health care risks:** absent or inadequate prenatal care

Published state-specific data are only available for a small number of perinatal risk factors, but this information provides important insights into the reasons for different birth outcomes in the states participating in the WIC/Medicaid study, demonstrating why risk factor differences must be taken into account in the analysis.

One of the most important risk factors for adverse pregnancy outcomes is low socioeconomic status. As illustrated in Table II.2, a recent study by the National Governors' Association (Newacheck, 1988) highlights the contrast between the five study states in the proportion of women of childbearing age with incomes below various poverty thresholds. In particular, Minnesota has a considerably lower percentage of women of childbearing age below poverty than the other four states, and the contrast is even more marked when comparing the proportion of women below 185 percent of the poverty level. At the other end of the spectrum, South Carolina has the highest percentage of women in poverty of all five states. National data are available on the proportion of women of childbearing age with incomes below 100 percent of the poverty level in 1986. North Carolina's 1984-1986 rate is very close to the 1986 national average, while Minnesota's rate is considerably below the national average, and the other three states have rates above the national average.

In addition to the poverty status of women of childbearing age, Table II.2 shows state- and race-specific information on three other key perinatal risk factors: births to teenagers, births to unmarried women, and inadequate prenatal care. Each of these issues is reviewed in turn, with discussions of the differences among the study states.

- **Births to Teenagers.** Nationally, the percentage of total births to teenagers has declined in recent years, overall and on a race-specific basis. However, the black teenage birth percentage is still approximately twice the corresponding white rate. Among the states participating in the WIC/Medicaid study, the contrast between the teenage birth percentage in Minnesota and the four southern states is marked. This is not simply a reflection of the high proportion of total births in Minnesota that are to white women; in 1986, the white teenage birth percentage was also one of the lowest in the country. In contrast, as the 1986 data show, the four southern states all had high teenage birth percentages and, in North Carolina, South Carolina, and Texas, this reflected high race-specific rates. In Florida, the black teenage birth percentage was above the U.S. rate in 1986, but the white percentage was the same as the U.S. average.
- **Births to Unmarried Women.** In contrast to teenage births, the percentage of births to unmarried women in the U.S. has grown

TABLE II.2
PERINATAL RISK FACTORS: U.S. AND STUDY STATES

Risk Factor	U.S.	Florida	Minnesota	N. Carolina	S. Carolina	Texas
Percent of Women 15-44, Below Poverty Thresholds, 1984-86						
< 100 percent	14.5 (1986)	15.4	11.4	14.0	17.3	15.2
< 150 percent	n/a	26.8	19.4	24.2	29.4	25.5
< 185 percent	n/a	34.4	25.0	32.3	37.6	33.1
Percent of Births to Teenagers, 1986						
All	12.6	13.8	7.3	15.9	16.6	15.2
White	10.6	10.6	6.3	12.5	12.4	14.1
Black	22.8	24.0	21.4	24.1	23.4	23.6
Percent of Births to Unmarried Women, 1986						
All	23.4	26.7	16.3	23.6	27.6	17.7
White	15.7	15.1	13.4	9.7	10.5	12.8
Black	61.2	63.9	64.6	56.7	54.9	49.1
Percent of Births to Women Receiving Early Prenatal Care, 1986						
All	75.9	68.4	80.0	77.7	67.3	66.8
White	79.2	74.1	82.0	83.9	76.5	68.4
Black	61.6	50.5	58.8	63.5	53.0	56.4
Percent of Births to Women Receiving Late or No Prenatal Care, 1986						
All	6.0	8.6	3.8	4.6	8.1	11.5
White	5.0	6.9	2.9	2.8	5.1	11.1
Black	10.6	14.1	12.4	8.6	12.8	14.0

SOURCES: (1) Newcheck, Paul W. Estimating Medicaid-Eligible Pregnant Women and Children Living Below 185% of Poverty, Washington, DC: National Governors' Association, 1988; (2) Hughes, Dana et al. The Health of America's Children. Maternal and Child Health Data Book, Washington, DC: Children's Defense Fund, 1989; (3) U.S. Bureau of the Census, Current Population Survey, 1986

TABLE II.3
BIRTHS BY HISPANIC ORIGIN OF MOTHER, 1987
(PERCENT OF TOTAL BIRTHS)

State	Hispanic Origin				Other and Unknown Hispanic	Non- Hispanic	Unknown	Total
	Mexican	Puerto Rican	Cuban	Central and South American				
Florida	1.6	1.4	3.8	1.8	2.7	87.7	1.0	100.0
Texas	29.3	0.2	0.1	1.4	1.4	67.3	0.3	100.0
All Reporting States ¹	10.7	1.6	0.4	2.1	2.4	79.8	3.0	100.0

SOURCE: National Center for Health Statistics. Advance Report of Final Natality Statistics, 1987, Monthly Vital Statistics Report, vol. 38, no. 3, Supplement, June 29, 1989.

¹Twenty-three states and the District of Columbia reported these data in 1987.

rate of decline in the rate of infant mortality has slowed in the 1980s and little progress has been made in the prevention of low birthweight. While the nonwhite population is small, concerns are growing over recent increases in infant deaths in the minority population. In addition pockets of the state exist in which prenatal care access and adequacy are significant problems.⁸

In contrast to Minnesota, the three southeastern states, North Carolina, South Carolina, and Florida all have high infant mortality rates relative to the national average, with problems being especially severe in South Carolina. Differences among the southeastern states are highlighted when comparisons are made of perinatal outcomes among the states in U.S. Department of Health and Human Services (DHHS) Region IV.⁹ Region IV includes some of the poorest states in the country and states with relatively large black populations. Overall, and by race, the Region has consistently had infant mortality rates that are above the U.S. average. An examination of birth outcome trends among the individual states in the Region reveals that South Carolina consistently has more adverse outcomes than the Region as a whole, Florida has marginally better outcomes, and North Carolina closely tracks the regional average (RNDMU, 1988).

State staff in South Carolina expressed their concerns that so little progress is being made. Within Region IV, the infant mortality rate in Mississippi, which has higher rates of known risk factors than South Carolina, is now declining faster than in South Carolina. In addition, the proportion of women who receive inadequate prenatal care in South Carolina is growing, especially in the urban areas. Inadequate prenatal care is also a major concern in both Florida

⁸A recent study (Lia-Hoagberg et al., 1988) discussed the problems of adverse pregnancy outcomes and inadequate prenatal care among low-income women and minorities in Minneapolis. Between 1983 and 1986, 16.5 percent of new mothers living in the poorest census tracts in Minneapolis received late or no prenatal care compared to 3.2 percent of new mothers from the most affluent census tracts.

⁹DHHS Region IV consists of the following states: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee.

and North Carolina; in North Carolina it is believed both that adverse perinatal outcomes are increasing and access to prenatal care is deteriorating.

Of the five states in the WIC/Medicaid study, Texas is somewhat of an anomaly. First, it is extremely large, accounting for over 8 percent of all U.S. births, which is more than Florida, North Carolina, and South Carolina combined. Secondly, from an ecological perspective, its birth outcomes seem inconsistent. Rates of adverse pregnancy outcomes in Texas are routinely at or below the U.S. averages, while early prenatal care enrollment rates are among the lowest in the country. As pointed out in this chapter, a significant part of this apparent contradiction is probably due to the large Hispanic population in Texas and, perhaps, to the unreliability of infant mortality reporting in the border regions.

III. STRUCTURE AND OPERATION OF THE WIC PROGRAM

The Special Supplemental Food Program for Women, Infants and Children (WIC) was authorized by Congress in 1972 to provide nutritional screening, food assistance, and nutritional education for low-income pregnant women, breastfeeding women, postpartum women, infants, and children up to age five, who are at nutritional risk. The major goal of WIC prenatal nutritional supplementation and education is to improve the nutritional status of low-income pregnant women. In most states the WIC program has become one of the largest and most important public health programs for low-income pregnant women and infants, but both the extent to which the WIC program is integrated with other maternal and child health services and the proportion of eligible women and infants who participate vary considerably across the states.

The WIC program is administered in each state by the designated state agency under federal guidelines. The staff at the state level is typically small and has the following responsibilities:

- ensuring that the WIC program meets federal guidelines
- maintaining the fiscal integrity of the program, which includes accounting for the food instruments that are issued to participants
- operations of the WIC food delivery system
- funding allocation, guidance, and technical assistance to local agencies
- caseload management

WIC client services—including eligibility certification, nutrition education, and food instrument distribution—are provided by local WIC agencies. These may be arms of the state or independent local organizations with which the state contracts.

TABLE III.1
WIC NUTRITIONAL RISK PRIORITIES

Priority I	Pregnant women, breastfeeding women and infants at nutritional risk as demonstrated by hematological or anthropometric measurements, or other documented nutritionally related medical conditions which demonstrate the need for supplemental foods
Priority II	Except those infants who qualify for Priority I, infants up to six months of age of Program participants who participated during pregnancy, and infants up to six months of age born of women who were not Program participants during pregnancy but whose medical records document that they were at nutritional risk during pregnancy due to nutritional conditions detectable by biochemical or anthropometric measurements or other documented nutritionally related medical conditions which demonstrated the person's need for supplemental foods
Priority III	Children at nutritional risk as demonstrated by hematological or anthropometric measurements or other documented medical conditions which demonstrate the child's need for supplemental foods
Priority IV	Pregnant women, breastfeeding women, and infants at nutritional risk because of an inadequate dietary pattern
Priority V	Children at nutritional risk because of an inadequate dietary pattern
Priority VI	Postpartum women at nutritional risk
Priority VII	(State agency option). Previously certified participants who might regress in nutritional status without continued provision of supplemental foods

their maximum caseload are required to maintain waiting lists. The priority system must be used to select new participants from the waiting list as new caseload slots become available. Local agencies using a retail purchase food delivery system are required to issue a food instrument (voucher) to program participants at the same time as the notification of certification. The voucher provides benefits for the current month and can be redeemed immediately.

- **Certification Periods.** The length of the certification period is determined according to the category of eligibility. Pregnant women must be certified for the duration of their pregnancy and up to six weeks postpartum. However, participants can be disqualified during the certification period for participant abuse or for failure to pick up their food instruments or supplemental foods for a number of consecutive months as specified by the state agency.
- **Dual Participation.** State agencies are required to work with local agencies to prevent and detect dual participation within each local agency and between local agencies. In addition, in areas where local agencies serve the same populations as Indian State agencies or Commodity Supplemental Food Program (CSFP) agencies, agreements must be entered into for the prevention and detection of dual participation.
- **Supplemental Foods.** Six food packages, which are divided into groups of nutritionally equivalent foods, are available under the WIC Program. Participants receive authorized supplemental foods prescribed from the food packages according to their eligibility categories and nutritional needs. Participants are not required to have a food from each food group if this conflicts with taste or other health considerations. State agencies are required to identify foods for use in the program to meet the specifications of the food packages. They must ensure that local agencies make available at least one food from each group in each food package.
- **Nutrition Education.** Nutrition education is a required benefit under the program, but participants may not be denied supplemental foods for failure to attend nutrition education activities. State agencies must (1) develop and coordinate the nutrition education program, (2) provide inservice training and technical assistance in nutrition education to local agencies, (3) identify or develop resources and educational materials for use in local agencies, (4) develop and implement procedures to ensure that nutrition education is offered to all adult participants, parents or guardians of infant and child participants, and child participants, whenever possible, (5) conduct annual evaluations of nutrition education activities, (6) monitor local agency activities, and, (7) establish standards for nutrition education contacts. Local agencies are required to develop an annual nutrition education plan to be submitted to the state agency. They must ensure that nutrition education is provided for participants, either through direct service provision or through an agreement with another agency. Nutrition education contacts can be in individual or in

group sessions, and at least two contacts must be made available to all adult participants during each six-month certification period.

- **Food Delivery Systems.** State agencies may operate up to three types of food delivery systems: retail purchase, home delivery, or direct distribution. They are responsible for the fiscal management and integrity of the food delivery systems under their jurisdiction, and only their authorized food vendors may redeem food vouchers. State agencies must account for the disposition of all food instruments as validly redeemed, lost or stolen, expired, duplicate, voided, or not matching the issuance record. Food instrument reconciliation requires that each food instrument issued be reconciled with food instruments redeemed. Participants may be issued no more than a three-month supply of food instruments at any one time.
- **Program Costs.** Two kinds of allowable costs exist under the program: food costs, and administrative and nutrition services costs. Administrative and nutrition services costs include the cost of nutrition education activities, expenditures for which must be greater than or equal to one-sixth of either the state agency's administrative and nutrition services expenditures or its administrative and nutrition services grant, whichever is less. Other legitimate administrative and nutrition services costs include the costs of certification procedures, outreach services, administration of the food delivery system, translators and interpreters, fair hearings, transportation of rural participants, and monitoring and reviewing program operations. Costs that are only allowable with prior approval from FNS include the costs of automated information systems and outside management studies, and capital expenditures over \$2,500.

There are many other federal requirements which state and local agencies must meet, but those listed here have the most bearing on the WIC/Medicaid study. With this background, variations in the structure and operation of the WIC program in the study states are now discussed.

B. STRUCTURE AND OPERATION OF THE WIC PROGRAM IN THE STUDY STATES

Because of the federal program specifications, the state WIC programs share common features, but some important differences are also found. Table III.2 displays major features of the WIC programs in the five states, broken down into the following major categories:

TABLE III.2
CHARACTERISTICS OF THE WIC PROGRAM IN THE STUDY STATES

	Florida	Minnesota	North Carolina	South Carolina	Texas
SIZE OF PROGRAM					
Total Budget FY 1986 (\$ million)	52.7	24.7	47.4	35.2	104.8
FY 1987 (\$ million)	57.8	25.6	49.0	36.2	112.4
FY 1988 (\$ million)	63.3	26.9	51.7	38.0	121.3
Average Monthly WIC Participants, 1987					
Total	117,600	56,300	106,400	73,500	226,300
Women	31,000	8,800	22,000	16,600	51,600
ROLE OF STATE AND LOCAL AGENCIES					
Relationship of Local WIC Agencies to State Agencies	Arm of State (Mostly)	Autonomous (Mostly)	Autonomous (Statewide)	Arm of State (Statewide)	Autonomous (Mostly)
State Supplement to WIC Budget	No	Yes (Commencing 1988)	No	No	Yes (Commencing 1987)
AVAILABILITY AND ACCESSIBILITY OF WIC SERVICES					
WIC Program Statewide	Yes	Yes	Yes	Yes	Yes (Effective April 1990. In 1988 34 counties were unserved.)
Income Eligibility Criteria	185% of poverty (Statewide, as of July 1988. Prior to this 15 counties were below 185% of poverty. Most used 150%)	185% of poverty (Statewide).	125% - 185% of poverty	185% of poverty (Statewide)	185% of poverty (Statewide. May have been 150% in some locations in 1987.)
Priorities	1-6 (Statewide. Except Dade County which does not serve 4-6.)	1-6 (Mostly. Some agencies not serving 6. Some 7s now being served. In 1987 served 1-4 statewide, and some agencies were serving 5s.	1-6 (Mostly. A few agencies did not serve 6 in 1987 and one did not serve 5 or 6.	1-6 (Statewide)	1-6 (Statewide. Excludes Priority 6 women with risks of diet excess weight.)
Waiting Lists	No	Yes (Efforts made to ensure pregnant women not placed on waiting list)	No (But pregnant women experience delays because of constraints in public prenatal care system)	Yes (Only with State approval. No waiting lists for Priorities 1, 2, and 3)	No (But long waits for appointments to occur.)
Colocation of Prenatal Care and WIC Services	Yes	No (Mostly)	Yes (Mostly)	Yes (Mostly)	Mixed (Mostly)
CSFP Participation	No	No	Yes (St. Paul, Olmsted County, and Red Lake Indian Reservation)	Yes (Harris County)	No
PROGRAM COSTS 1987					
Average Monthly Food Costs Per Person (\$)	33.22	29.81	30.46	32.97	33.32
Average Monthly Administrative Costs Per Person (\$)	7.84	8.03	7.48	7.91	7.86
Average Monthly Total Costs Per Person (\$)	41.06	37.85	37.94	40.89	41.19

SOURCES: Information collected from site visits, state documents, and interviews with state staff, and data from the Food and Nutrition Service, U.S. Department of Agriculture.

- size of the WIC program
- Role of state and local agencies
- Availability and accessibility of WIC services
- Program costs

Each of these issues is discussed in turn.

1. Size of the WIC Program

The WIC programs in the five study states vary greatly in terms of their total budgets, the total number of persons served, and the distribution of the caseload across the eligibility categories. In fiscal year 1987, WIC grants in the five states ranged from approximately \$26 million in Minnesota to \$112 million in Texas, with intermediate figures of \$36 million, \$49 million, and \$58 million for South Carolina, North Carolina, and Florida respectively.

Differences in aggregate expenditures are reflected in the differences in the total number of persons served by the WIC program. In 1987, the average number of persons served per month ranged from 56,000 in Minnesota to 226,000 in Texas. Data on the proportion of WIC participants who are pregnant women do not exist for all the study states, but information is available on the proportion of participants who are women. This appears to vary considerably, ranging from 15.6 percent in Minnesota to 26.3 percent in Florida. In the other three states, the proportion of participants who are women varies from 21 percent to 23 percent. Thus, in terms of casemix, the Minnesota WIC program has a lower proportion of women and a higher proportion of infants and children than the other states, while Florida has a higher proportion of women than the other states.

2. Role of State and Local Agencies

The degree to which the designated state WIC agencies can control the statewide operations of the WIC program and, therefore, the degree to which services and program operations are standardized at the local level, is dependent upon the amount of local agency autonomy. In this regard, the five study states afford an interesting contrast. In two of the five--

Minnesota and North Carolina--local WIC agencies are autonomous and, therefore, the state has little direct control over local programs. In another two of the study states--Florida and South Carolina--the local WIC agencies are, essentially, arms of the state agency, which allows the state considerably more control if it chooses to exercise it. A mixed system exists in Texas; most local agencies are autonomous, but there are also seven state-operated WIC centers.

3. Availability and Accessibility of WIC Services

To understand the factors that affect WIC participation by pregnant women in different states, the access barriers faced by pregnant women at the state and local level must be explored. In general, WIC access is facilitated if (1) potential WIC clients live near a WIC site, (2) income eligibility standards are high, (3) all nutritional risk priorities are served, (4) clients do not have to queue for services, (5) prenatal care and WIC services are available at the same location, and (6) other prenatal care providers refer their low-income clients to the program. Differences between the study states in these areas are described briefly here, followed by a discussion of variations in their WIC participation rates.

- **Service Proximity.** With regard to service proximity, Texas is the only one of the five states that did not have a statewide WIC program during the study period; in 1988 there were 34 unserved counties. The number of unserved counties in Texas has been steadily reduced, and the last unserved county will receive WIC services by April 1990. To facilitate access, all of the states use voucher pick-up sites in addition to certification sites.
- **Income Eligibility.** Income eligibility standards are relatively uniform across the five states. Nearly all WIC projects in all five states are using the 185 percent of poverty income criterion, although, in 1987, a few locations in Texas, Florida, and North Carolina may have used a lower income eligibility criterion.
- **Priorities.** All five of the study states currently serve priorities 1-6, and Minnesota is beginning to serve some Priority 7s. (In 1987, however, Minnesota was only serving priorities 1-4 statewide, and was beginning to make inroads into Priority 5.) While priorities may be uniform statewide, individual WIC agencies may not serve them all. Furthermore, states do not necessarily serve all of the potentially eligible client

categories within the priority classifications; Texas, for example, does not serve priority 6 women with dietary risks only or excess weight problems, and, until recently, Minnesota served no postpartum non-breastfeeding women. The development of formula rebate programs is allowing states to expand their WIC programs and serve all priorities. In South Carolina, for example, the formula rebate program implemented in April 1989 is enabling the State to serve all priorities. Similarly, Minnesota, which implemented its formula rebate program in October 1988, has expanded the WIC caseload and the number of priorities served.

- **Waiting Lists.** States differ in their strategies towards maintaining waiting lists, but it is clear that some states face more of a caseload management problem than others. In Minnesota, waiting lists and caseload management are important tools in program operations, and serve to identify excess demand for the WIC program. In other study states, efforts are made to avoid the use of waiting lists. While all states affirm that every effort is made to ensure that Priority I pregnant women are not placed on waiting lists, the reality may vary by state. Waiting lists are not officially used in Texas, but state staff indicated that, because of service delivery bottlenecks, waits as long as three months may occur for initial WIC appointments. In North Carolina, there is no WIC caseload management problem, but pregnant women may experience delays getting into the WIC program because of the constraints on public maternity care.¹⁰ Staffing problems also inhibit access in Dade County, Florida where, at the time of the MPR site visit in December 1988, 100 persons applied for WIC per week but only 20 were enrolled.
- **Colocation of Prenatal Care and WIC Services.** The study states also differ in the degree to which prenatal care and WIC services are colocated. In North Carolina, South Carolina, and Florida, most local health departments provide prenatal care and also constitute the majority of the WIC providers in those states. In Minnesota, in contrast, very few local health departments provide prenatal care. Consequently, with the exception of migrant health centers and a few clinics in the Twin Cities, WIC services and prenatal care are separate, with WIC largely being provided in the public sector and prenatal care being provided by private physicians. The situation in Texas is mixed; local WIC agencies are a combination of local health departments, Community Action Program (CAP) agencies, Migrant Health Centers, nonprofit health centers, and freestanding WIC centers.
- **Referral Patterns to WIC.** No reliable data on referral patterns to WIC exist in the study states, but all report problems in getting private physicians to refer patients for WIC services. A recent study by Buescher (1988) in North Carolina confirms that low-income pregnant

¹⁰This illustrates the importance of the local agency autonomy issue. North Carolina staff indicated that while the State Health Department does not require women to have a pregnancy test before commencing prenatal care, some local clinics may demand it.

women who receive their prenatal care in local health departments are much more likely to be participating in the WIC program than low-income women receiving prenatal care elsewhere.

Determining intrastate variations in participation rates is complicated by the limited county-specific data available on the size of the eligible populations.¹¹ However, even though the estimates of the potentially eligible populations are crude, states that have estimated participation rates show a wide variation across counties. In Minnesota, participation data for 56 local WIC agencies for June 1988 showed participation rates ranging from 29 percent to 123 percent, with a median of 55 percent.¹² Similar variation is indicated in North Carolina; in April 1987 the overall estimated participation rate was 44 percent, with participation in individual counties ranging from less than 25 percent to 90 percent.¹³ (Since the two states use different approaches to estimating the population at risk, interstate comparisons of participation rates should not be made.)

The reasons given for these differences in participation rates varied. In Minnesota, estimated participation rates are high in the north central and northeastern regions of the state and low in the south central and southwestern regions. These data support the perceptions of state staff that attitudes towards public programs vary by region, with acceptance being particularly strong in the Duluth area. In North Carolina, it is notable that three of the largest counties--Cumberland, Mecklenburg, and Onslow--all had estimated participation rates of less

¹¹In Minnesota, for example, county estimates of the population that is potentially eligible for WIC are made using the annual number of births and the percentage of the population below 185 percent of poverty in the 1980 Census. Assumptions are then made about the proportion of the population in different status categories who would be at nutritional risk, the length of time they would be on the program, etc.

¹²These wide ranges, in part, reflect the problem of estimating the potentially eligible population. This is also why it is possible for estimated participation rates to exceed 100 percent; in these cases the eligible population was clearly underestimated.

¹³The North Carolina participation rate estimates reflect the ratio of provisional participation in April 1987 to an estimate of the population at risk in 1985.

than 30 percent. According to North Carolina state staff, barriers to receiving public prenatal care, low referral rates by private providers, and the proportion of the target population that is in the labor force all play a role in the observed regional variations in participation rates.

Data are available from three of the study states--Minnesota, North Carolina, and Florida--on WIC participation by racial and ethnic minorities. In all three states, minority participation appears to be relatively high, which is indicative of the considerable efforts that states have made to enroll high-risk populations. In Minnesota, for example, 23 percent of all WIC participants in 1986 represented racial and ethnic minorities although only 10 percent of all births in 1986 were to minorities. Similarly, Florida data for September 1987 indicate that 46 percent of all WIC participants and 42 percent of women participants were black, compared to 24 percent of births in 1986; and, in North Carolina, in 1987, estimates indicate that 53 percent of births to women on WIC were nonwhite compared to 31 percent of all births.

4. WIC Program Costs

In 1987, reported WIC costs per case averaged around \$40.00 a month in across the study states, but interstate variation occurred. Table III.2 shows that costs per case were lower in Minnesota and North Carolina than in the other three states. The contrast in cost per case between North Carolina and South Carolina is particularly interesting, since they are adjacent states. In particular, average food costs per person were \$2.51 a month higher in South Carolina than in North Carolina. To what extent this difference is accounted for by different casemixes is not wholly clear. However, in a national study of 1986 WIC costs, Texeira and Puma (1987) suggest that states with higher proportions of women and infants among their WIC participants have higher average expected food costs per participant. According to the Texeira and Puma study, Texas had much higher costs per participant than it would if casemix had been taken into account. Florida, too, had lower costs after adjusting for casemix. Conversely, Minnesota's costs per participant were much lower than they would have been if casemix had been taken into

account. However, casemix appeared to make little difference to costs in North Carolina and South Carolina.

C. SUMMARY

This chapter reviews the federal requirements for the WIC program and the structure and operations of the program in the study states. To some extent, interstate variation in program operations is limited by the specificity of the federal requirements. Nonetheless, considerable differences in program operations occur at the local level over which the state agencies have varying amounts of control. For example, in a state such as South Carolina, where most local WIC agencies are arms of the state, it is easier to ensure that program standards are met than in Minnesota, where the local agencies are autonomous.

Even though the data are limited, program participation rates also appear to vary considerably. This, too, may be partly a reflection of differences in program structure. All of the states report problems in obtaining private sector WIC referrals, but the impact of this upon program participation depends on the extent of private sector provision of prenatal care for low-income women. In Minnesota, where there is little or no public prenatal care available, WIC participation is dependent upon referrals from the private sector, and the proportion of women in the WIC program appears to be lower than in the other states where public sector prenatal care is more widely available. The lack of public prenatal care in some counties creates access problems in North Carolina and Texas also. In addition, WIC participation in Texas in 1988 was limited because 34 counties were unserved.

A major factor that is now affecting the scope of WIC program operations in many states is the development of infant formula rebate programs. These programs, in which state agencies contract with one (or more) infant formula manufacturers and receive rebates on bulk purchases of infant formula for WIC participants, are generating considerable savings and, in consequence, allowing states to expand their WIC programs. Because these initiatives are relatively recent,

their full impact has yet to be assessed, but it is clear that major program expansions are underway. South Carolina anticipates that the formula rebate will allow the WIC program to expand to cover all priorities and to expand food packages. Minnesota has used its formula rebate, which was initiated in October 1988, to expand caseload from approximately 56,000 to 70,000. Florida began its formula rebate program in late 1987, and estimates that the caseload will increase by 40,000 in consequence. Similarly, the WIC caseload has increased by 80,000 in Texas, which began its formula rebate program in May 1988. North Carolina also has a formula rebate program, which commenced in 1988. Thus, the number of pregnant women participating in the WIC program should increase in all the study states as a result of formula rebate programs. The relative impact on prenatal participation will vary, however, depending upon (1) the proportion of pregnant women who were already participating, and (2) the extent of outreach and program coordination efforts.

Differences in program participation rates among and within the study states have important implications for the WIC/Medicaid study in which a major analytical issue is understanding the WIC participation decision and its impact on Medicaid cost savings. In addition, WIC food cost differences among the study states may also have implications for the estimated state-specific benefit/cost ratios.

IV. STRUCTURE AND OPERATIONS OF THE MEDICAID PROGRAM

Medicaid is a joint federal and state program, authorized under Title XIX of the Social Security Act, to reimburse the covered medical care costs of low-income persons. It is the largest program providing health services for the poor, but by no means are all low-income persons eligible. Eligibility is dependent upon categorical status in addition to income, and states have considerable discretion in determining income eligibility ceilings. In addition, while a core group of services is federally mandated, states can choose to offer a wide range of optional services and can also impose service limits on both mandated and optional services.

For many years Medicaid eligibility for low-income pregnant women and children was linked to eligibility for Aid to Families with Dependent Children (AFDC). This effectively excluded low-income pregnant women in two parent households and low-income women in their first pregnancy, although some states opted to cover some of these women. In addition, AFDC payments in some states were, and are, so low that many women below the poverty level were still not poor enough to qualify for Medicaid. States have the option to establish medically needy programs whereby Medicaid coverage can be provided to persons (1) who meet the state's Medicaid categorical eligibility criteria, and (2) whose income and resources are below the medically needy income standards established by the state. However, the medically needy income standard may not exceed 133 and 1/3 percent of the AFDC payment standard, which is extremely low in some states. Typically, low-income women with high obstetrical costs could "spend down" and become eligible for Medicaid through the medically needy program, but were ineligible for Medicaid during their pregnancies.

In the 1980s, Congress became increasingly concerned about the high human costs of inadequate prenatal and newborn care for low-income women and infants, and the corresponding indigent care burdens placed upon states and public hospitals. This concern has prompted a

series of Medicaid expansions for low-income women and infants, some of them optional and some mandatory. Section A of this chapter reviews the recent legislative history of Medicaid program expansions for pregnant women and infants. Following this, in Section B, characteristics of the Medicaid programs in the study states are explored. Section C summarizes the findings of the chapter.

A. RECENT LEGISLATIVE HISTORY

The growing awareness of the cost-effectiveness of prenatal care in the early 1980s occurred amid growing concerns about the rising costs of maternity care and the inadequacies of maternity care financing. While rising malpractice costs were causing some physicians to drop their obstetrical practices entirely--this problem being especially serious in Florida--access problems were particularly severe for low-income pregnant women and infants, many of whom lacked any form of health insurance coverage.

In response to these concerns, Congress authorized a series of expansions of the Medicaid program for pregnant women and infants. These expansions have involved incremental progress towards (1) elimination of categorical eligibility requirements, (2) severing the link between Medicaid and AFDC income eligibility criteria, and (3) broadening the range of reimbursable services. The specific legislative steps taken by Congress include the following:

- **The Deficit Reduction Act of 1984 (DEFRA)** mandated that states provide Medicaid coverage to: (1) first-time pregnant women who would be eligible for AFDC if the child was born; (2) pregnant women in two-parent families in which the principal wage earner is unemployed; and (3) financially-eligible children up to age five. Infants could be granted automatic Medicaid coverage for the first year of life, without having to make a separate Medicaid application, as long as their mothers remained eligible.
- **The Consolidated Budget Reconciliation Act of 1985 (COBRA)** mandated that states provide prenatal, delivery, and postpartum services to all income-eligible pregnant women regardless of family structure, thus eliminating the categorical eligibility requirement for pregnant women. The Act also mandated 60 days of postpartum coverage for all women

whose Medicaid eligibility was based solely upon pregnancy, ensuring that all infants born to Medicaid-eligible women would have at least 60 days of automatic Medicaid coverage as long as they lived with their mothers. In addition, since COBRA created a new group of categorically needy pregnant women, spenddown eligibility had to be extended to any pregnant woman whose medical costs brought her income and resources below medically needy levels. COBRA also allowed states the option of "waiving comparability," to provide pregnant women with additional services that were not provided to other Medicaid recipients.

- **The Omnibus Budget Reconciliation Act of 1986 (OBRA-86)** granted states the option of expanding Medicaid coverage for pregnant women, and children up to age five on an incremental basis, with income eligibility levels up to 100 percent of the federal poverty level, regardless of AFDC payment standards. In addition, the following new initiatives were included in the OBRA-86 options: (1) continuous eligibility, whereby pregnant women who were eligible for Medicaid at some time during their pregnancies, could be granted continuous coverage for up to 60 days postpartum, regardless of changes in their income; (2) presumptive eligibility, allowing certain primary care providers to authorize short-term Medicaid presumptive eligibility status for pregnant women; and (3) waiver of the asset test, thus allowing financial eligibility criteria for pregnant women and infants to be based upon income only.
- **The Omnibus Budget Reconciliation Act of 1987** continued these income eligibility expansions by allowing states to authorize Medicaid coverage for pregnant women and infants up to age one below 185 percent of the poverty level. In addition, states could speed-up the coverage of children under five years of age below the poverty level, and could expand coverage to children below the poverty level, between the ages of five and eight, on an incremental basis.
- **The Medicare Catastrophic Act of 1988** required states to grant Medicaid coverage to all pregnant women and infants up to age one below the poverty level, and allowed them two years to accomplish this. Hence, most of the options of 1986 became mandates in 1988. In addition, states could no longer place absolute limits on the annual number of Medicaid reimbursed inpatient days for infants in neonatal intensive care in Medicaid disproportionate share hospitals. Thus, Medicaid programs were required to recognize explicitly the very long lengths of stay of severely compromised newborns.
- **The Omnibus Budget Reconciliation Act of 1989** mandated that states expand Medicaid coverage to pregnant women and children up to age six living at or below 133 percent of the poverty level. States will be implementing this mandate in 1990. In addition, states will be required to provide all optional Medicaid services to children—including services that are not part of the State Plan—if such services are necessary to treat conditions identified through Early and Periodic Screening Diagnosis and Treatment (EPSDT) screens.

The rapidity of these legislative actions affecting Medicaid has made it difficult to keep track of program changes at the state level and to evaluate the cost impact of these changes, especially since many states have responded to the new options with alacrity. Furthermore, states responses have gone far beyond Medicaid income-eligibility expansions alone. For many states, the financial opportunities provided by increased Medicaid funding have served as a catalyst for major new programmatic initiatives for low-income pregnant women and infants and for increased coordination efforts among a broad range of maternal and child health programs. In addition, each state's response has been targeted towards its identified high-risk populations and tailored to its particular institutional structures and health service delivery systems.

B. CHARACTERISTICS OF THE MEDICAID PROGRAM IN THE STUDY STATES

For purposes of this evaluation project, it is important to realize that Medicaid programs in the study states were in a state of flux during the evaluation period because of the changes in income-eligibility criteria and program enhancements brought about by the Medicaid expansions. This may render it more difficult to draw clear inferences about the impact of prenatal WIC participation upon Medicaid costs for pregnant women and newborns. As states have adopted the new options and mandates, participation incentives for both providers and recipients have changed along with eligibility criteria and provider reimbursement methods and amounts. In addition, Medicaid program expansions in some states have included enhanced program coordination and referral for low-income pregnant women. Thus, WIC participation may be influenced by the Medicaid program expansions.

In this section, the characteristics of the Medicaid programs in the study states are reviewed, recording major changes that occurred during the study period. These features are summarized in Table IV.1 and include the following topics:

- Medicaid financing
- Medicaid eligibility for pregnant women and infants

TABLE IV.1

CHARACTERISTICS OF THE MEDICAID PROGRAM IN THE STUDY STATES

	Florida	Minnesota	N. Carolina	S. Carolina	Texas
FINANCING					
Federal Financial Participation Rate (%)					
FY 1986	56.2	53.4	69.2	72.7	53.6
FY 1987	56.2	53.4	69.2	72.7	55.2
FY 1988	55.4	54.0	68.7	73.5	56.9
Local Financial Participation	Yes	Yes	Yes	No	No
	Counties pay 35% of cost of inpatient hospital days > 12 and < 48.	Counties finance 10% of non-federal share and all of the administrative costs for eligibility determinations.	Counties finance 15% of non-federal share and 50% of administrative costs for eligibility determinations.		
ELIBILITY FOR PREGNANT WOMEN AND INFANTS					
Percent of Total Births Reimbursed by Medicaid Prior to OBRA-86 and OBRA-87 Expansions	9 (1986)	12 (1985: Includes Medicaid and GAMC.)	16.5 (1986)	18 (1986)	15 (1987)
Medicaid Income Eligibility Threshold, July 1988, as Percent of Poverty.					
AFDC, family of three	34.1	65.9	32.9	49.9	22.8
Medically Needy, family of three	45.4	87.8	44.3	-	33.1
OBRA-86 Eligibility Threshold for Pregnant Women and Infants, as Percent of Poverty. (Effective Date)	100.0 (10/87)	-	100.0 (10/87)	100.0 (10/87)	100.0 (9/88)
OBRA-87 Eligibility Threshold Pregnant Women and Infants, as Percent of Poverty. (Effective Date)	150.0 (7/89)	185.0 (10/88)	150.0 (1/90)	125.0 (4/89) 185.0 (7/89)	(130.0) (9/89)

Table IV.1 (page 2)

	Florida	Minnesota	N. Carolina	S. Carolina	Texas
ELIGIBILITY (continued)					
Other OBRA-88 Options for Pregnant Women (Effective Date)					
Continuous Eligibility	Yes (10/87)	Yes (7/87)	Yes (10/87)	Yes (10/87)	Yes (9/88)
Presumptive Eligibility	Yes (10/87)	No	Yes (10/87)	No	Yes (9/88)
Waive Asset Test	Yes (10/87)	Yes (7/87)	Yes (10/87)	Yes (10/87)	No
<u>SERVICE LIMITS AFFECTING PREGNANT WOMEN AND INFANTS</u>					
Physician	Yes 1 inpatient hospital visit per day. 1 office visit per provider per day.	No	No	Yes 18 ambulatory visits per annum but most maternal and infant care not affected.	No
Inpatient Hospital	Yes 45 days per annum. Effective October 1988, infants under age 1 were allowed 120 days per annum. The limit was eliminated entirely for infants in July 1989.	No	No	No	Yes In 1987, 30 days per spell of illness with 60 day break, plus a \$50,000 expenditure cap. Cap raised to \$200,000 in November 1988. Other restrictions unchanged.
<u>PROVIDER REIMBURSEMENT</u>					
Methods for Reimbursing Physicians for Prenatal and Delivery Services	Global or individual visits	Global or individual visits (Extra visits can be billed under global for high-risk women.)	Global or individual visits (Extra visits can be billed under global for high-risk women.)	Individual visits only (Could bill global prior to 7/88.)	Individual visits only (Only global billing allowed prior to 9/88.)

Table IV.1 (page 3)

	Florida	Minnesota	N. Carolina	S. Carolina	Texas
PROVIDER REIMBURSEMENT (continued)					
Requirements for Global Billing	10 prenatal visits for low-risk; 15 prenatal visits for high-risk (Prior to 10/87, only 5 visits required.)	Six-week post-partum visit	Prenatal visit 90 days prior to delivery	5-13 prenatal visits (Prior to 7/88.)	At least one post-partum visit (Prior to 9/88)
Physician Reimbursement Rates, 1986					
Global (\$)	315.00	N/A	409.00	485.00	442.10
Delivery Only (\$)	232.00	N/A	308.00	275.00	434.36
Prenatal Visit (\$)	10.00	N/A	N/A	15.00	14.40
Approximate community charge, global (\$)	1800.00	2250.00	N/A	1000.00	1800.00
Fee-to-community-charge ratio (percent)	17.5	N/A	N/A	48.5	24.6
Physician Reimbursement Rates, 1987 or 1988 (Effective Date)					
Global (\$)	800.00 for low-risk 1,200.00 for high risk (10/87)	500.00 (12/88)	625.00 (10/87)	N/A	N/A
Delivery only (\$)	400.00	N/A	350.00	500.00 (7/88)	600.00 (9/88)
Prenatal visits (\$)	50.00 for initial and postpartum visits; 21.50 for other prenatal visits	N/A	21.00	50.00 for initial visit only	16.00
Approximate Community Charge, global (\$)	N/A	N/A	1200.0	N/A	N/A
Fee-to-community-charge ratio (percent)	N/A	N/A	52.1	N/A	N/A

Table IV.1 (page 4)

	Florida	Minnesota	N. Carolina	S. Carolina	Texas
<u>METHODS FOR REIMBURSING HOSPITALS FOR DELIVERY AND NEWBORN SERVICES</u>	Hospital-specific prospective per diem rates, with county ceilings	DRGs (Day and cost outliers allowed.)	Hospital-specific prospective per diem rates	DRGs for normal deliveries (Newborn care reimbursed on per diem basis.)	DRGs (Newborn care reimbursed on cost basis.)
HMO PARTICIPATION	Yes Approximately 44,000 Medicaid enrollees state-wide in 1988 (12.5% of AFDC Medicaid recipients).	Yes Hennepin County (35%) Dakota County (100%) Itasca County (100%) plus small numbers of voluntary enrollments in Ramsey & Lake Counties; approximately 25,000 enrollees in total (9% of all Medicaid recipients)	No	No	No

SOURCES: In addition to information collected from site visits, state documents, and interviews with state staff, the following sources were used in compiling this table: 1) National Governors' Association update reports on state-specific Medicaid eligibility thresholds for pregnant women and children; 2) Lewis-Idema, Deborah. Increasing Provider Participation, Washington, DC: National Governors' Association, 1988; and 3) U.S. Congress, Congressional Research Service. Medicaid Source Book: Background Data and Analysis, Washington, DC: U.S. Government Printing Office, 1988.

- service limits affecting pregnant women and infants
- provider reimbursement
- HMO participation
- special Medicaid initiatives for pregnant women and infants

1. Medicaid Financing

The Medicaid program is jointly financed by the federal and state governments, with local financial participation also occurring in some states. The degree of federal financial participation in a state's Medicaid program is directly related to the per capita income of the state but, by statute, is never less than 50 percent or more than 83 percent. For a state with per capita income exactly equal to the national average, the federal financial participation rate would be 55 percent. Obviously, the higher the federal match rate, the more attractive it is for states to expand their Medicaid programs, since the federal government will be picking up a larger share of the costs. However, because of their low tax bases, it is often difficult for the poorer states to take advantage of their high match rates, since raising the funds for the state share is still problematic.¹⁴ Three of the five study states--Minnesota, Florida, and Texas--have low to moderate match rates, all being below 60 percent in 1987. (However, the steady increase in the Texas match rate between 1986 and 1988, indicative of the decline in per capita income in Texas, is worthy of note.) North Carolina (69 percent) and South Carolina (73 percent) have considerably higher match rates, reflecting their lower per capita incomes.

In addition to federal financial participation rates, knowledge of local financial participation requirements is important for understanding the differential impact of new program initiatives. For example, financially strapped local governments, that are required to support the administration of income maintenance programs, may not have sufficient resources to increase

¹⁴The General Accounting Office (1987) concluded that the use of per capita income in determining the state share did not adequately reflect the greater tax burden of states with a high proportion of the needy and, thus, was not the best measure of states' ability to finance Medicaid from state revenue sources.

the number of eligibility workers when program expansions are initiated at the state level. Those that are required to pay part of the non-federal share of Medicaid costs may be disinclined to encourage increased service utilization.

The extent of local financial participation in Medicaid varies considerably among the five study states. In South Carolina and Texas no local cost sharing is required. Florida requires local governments to pay 35 percent of the costs of longer Medicaid hospital stays (between 12 and 45 days), as well as a minimal proportion of nursing home costs. North Carolina and Minnesota both require local governments to pay part of the non-federal share of Medicaid costs (10 percent in Minnesota and 15 percent in North Carolina) and also to pay administrative costs for eligibility determinations. In North Carolina, local governments must pay for 50 percent of these administrative costs, and in Minnesota these costs are entirely locally financed. Thus, it is clear that the Medicaid program expansions initiated under OBRA-86 and OBRA-87 will place a greater burden on local governments in Minnesota and North Carolina than in the other three states.

2. Medicaid Eligibility for Pregnant Women and Infants

Prior to eligibility expansions resulting from OBRA-86, OBRA-87, and the Medicare Catastrophic Bill in 1988, Medicaid income eligibility standards for pregnant women and infants were the same as for other AFDC-related groups. Three of the five study states--North Carolina, Florida, and Texas--have extremely low Medicaid income eligibility thresholds, with Texas having one of the lowest thresholds in the nation (AFDC payment standard less than 25 percent of the federal poverty level). Thus, even though all three of these states have medically needy programs, the medically needy income eligibility threshold, being tied to the AFDC payment standard, is very low. South Carolina's AFDC payment standard is also extremely low, but South Carolina is one of eight states that have chosen to use the higher AFDC standard of need to determine Medicaid eligibility. Thus, the AFDC-related Medicaid income eligibility standard in South

Carolina is approximately 50 percent of the federal poverty level. While still not generous, this is considerably higher than the other three southern states. However, during most of the project period, South Carolina did not have a medically needy program and, therefore, spenddown eligibility for persons with large medical bills did not exist. The medically needy program, which only existed for pregnant women and infants anyway, was dropped in March 1987, in part because income eligibility was going to be expanded for these population groups under OBRA-86. The program has now been reinstituted in South Carolina, but with an income eligibility ceiling at less than one-third of the poverty level (National Governors' Association, 1990).

In contrast to the four southern states, Minnesota, because of its relatively high AFDC payment standards (approximately 66 percent of the federal poverty level), has always had one of the highest Medicaid income eligibility standards in the country. In addition, not only does Minnesota have a medically needy program, but there is also a state-funded General Assistance Medical Care Program (GAMC) which provides coverage for those who are not Medicaid eligible but meet the same income and resource standards.

In spite of its much higher income eligibility standards, the proportion of total deliveries reimbursed by Medicaid in Minnesota, prior to the OBRA-87 eligibility expansion, was relatively low; in 1985, 12 percent of all births were reimbursed either by Medicaid or GAMC. Medicaid reimbursed deliveries in the other study states ranged from 9 percent in Florida (1986) to 18 percent in South Carolina (1986). The differences between the states result from the interaction of several factors, including (1) Medicaid income-eligibility standards, (2) income distributions of the states' populations, (3) participation rates among those who are eligible, (4) Medicaid participation rates of providers, and (6) billing practices of participating providers. The Minnesota proportion was low because it is a relatively wealthy state with strong resistance to participation in welfare programs in some regions. Prior to its OBRA-86 eligibility expansion, Florida also had an extremely low proportion of Medicaid-reimbursed births, but in this case low

income eligibility standards were a factor, in addition to Florida's relative wealth. South Carolina, in contrast, is a very poor state with a strong public health tradition and somewhat higher Medicaid eligibility standards than the other three southern states, and the net result was a higher proportion of Medicaid-reimbursed births.

Following the passage of OBRA-86, North Carolina, Florida, and South Carolina expanded their income eligibility standards for pregnant women and infants to 100 percent of the poverty level, effective October 1, 1987. South Carolina subsequently raised its income eligibility to 125 percent of poverty, effective April 1989, and to 185 percent of poverty, effective June 1989. Florida has also raised its income eligibility ceiling further to 150 percent of poverty effective July 1989. In addition, all three states adopted the continuous eligibility provision and waived the asset test for pregnant women and infants. North Carolina and Florida also implemented presumptive eligibility programs.

Minnesota responded to OBRA-86 by adopting the continuous eligibility provision and waiving the asset test. However, the state chose not to expand income eligibility for pregnant women and infants specifically; rather, the state raised its medically needy threshold to 133 and 1/3 percent of the AFDC payment standard for all eligibility groups. As a result, effective July 1, 1987, Minnesota covered all pregnant women and infants with incomes below 88 percent of the poverty level. Subsequently, following passage of OBRA-87, Minnesota expanded income eligibility for pregnant women and infants up to 185 percent of poverty, effective October 1, 1988. Minnesota has also chosen to use state dollars to provide Medicaid coverage to all Medicaid-eligible children through age eight with incomes below 185 percent of poverty (National Governors' Association, 1990).

Texas did not respond to either OBRA-86 or OBRA-87 initially. However, following passage of the Medicare Catastrophic Act in 1988, the income eligibility ceiling for pregnant women and infants was raised to 100 percent of the poverty level in Texas. The threshold was

subsequently raised again--to 130 percent of the poverty level-- in September 1989. In addition the state adopted the continuous eligibility provision, and is piloting a presumptive eligibility program.

For the purposes of the WIC/Medicaid study, it is important to realize that the study populations in the five states were not comparable socioeconomically during the study period. Such differences may have affected both the participation rates in other programs and also the birth outcomes of Medicaid-eligible women. At the two extremes, Minnesota was covering pregnant women with incomes up to 88 percent of the poverty level whereas Texas was only covering pregnant women with incomes up to 33 percent of the poverty level. In Florida, North Carolina, and South Carolina, income eligibility levels changed from below 50 percent of the poverty level in the first three-quarters of the study year to 100 percent of the poverty level in the last quarter of the year. However, because eligibility expansions typically require a considerable start-up period, the full impact of this change may not have been felt until 1988. Differences in Medicaid income eligibility across states during the study period may have a significant effect on the empirical study results.

3. Service Limits Affecting Pregnant Women and Children

A review of service restrictions in state Medicaid programs does not indicate any major service limitations that would affect normal maternal and newborn care. However, restrictions exist in some states that, prior to the passage of the Medicare Catastrophic Act, may have limited Medicaid reimbursement for high-cost newborns. Obviously, such restrictions must be taken into account in evaluating the results of our study of the effects of prenatal WIC participation on Medicaid costs. States with service limitations may appear to have lower Medicaid costs than states without such restrictions, resulting from a shift in financial responsibility from Medicaid to other indigent care programs. Thus, since the analysis in the WIC/Medicaid study will focus upon Medicaid costs only, if WIC participation does have an effect upon Medicaid and indigent health

care costs during the first sixty days of life, the effect may be less apparent in states with Medicaid service restrictions.

Among the five study states, neither North Carolina nor Minnesota have any significant Medicaid service limits affecting pregnant women and newborns. In South Carolina, Medicaid allows a maximum of 18 ambulatory visits--including physicians' visits--a year; however, according to state Medicaid program staff, most maternal and infant care is not affected by this restriction. Texas and Florida, in contrast, had service limits in place during the study year that may have limited the number of days reimbursed by Medicaid for high-cost newborns. In 1987, the Texas Medicaid program paid for a maximum of 30 inpatient hospital days per spell of illness, and required a 60-day break before another reimbursable spell of illness. In addition, there was a \$50,000 expenditure cap. The cap was subsequently raised to \$200,000 in November 1988, with the other service restrictions remaining unchanged. Florida imposed restrictions on both physician visits and inpatient days in 1987. Medicaid recipients were allowed only one physician inpatient hospital visit per day--although other physician services in the hospital could be billed--and a maximum of 45 inpatient days per fiscal year. These limitations were changed effective July 1989. In particular, limits on hospital days for children under one year of age in Florida were eliminated.

4. Provider Reimbursement

The methods and the level of provider reimbursement affect both provider willingness to participate in the Medicaid program and the type and volume of services provided to Medicaid recipients. In this section, methods for reimbursing both physicians and hospitals for maternity-related services in the study states are reviewed.

a. Physician Reimbursement

For several years, states have struggled with the issue of the most appropriate methods to reimburse physicians for obstetric care to ensure that comprehensive care is provided to pregnant women in a cost-effective manner. Two broad approaches exist: physicians may be paid a global fee for comprehensive prenatal care and delivery services, or they may be paid separately for each individual visit and the delivery. States use either or both of these approaches, often requiring minimum levels of service provision for physicians to bill globally. In some states the global billing requirements are such that few Medicaid cases may qualify; if the minimum number of prenatal care visits required is high, global billing for women who do not seek prenatal care until relatively late in their pregnancies may be precluded.

Different physician reimbursement policies existed in the study states during the study period. Of the five states, only Texas prohibited individual visit billing. Florida, Minnesota, North Carolina, and South Carolina all permitted both global and individual visit billing, but with different requirements and specifications.

- Prior to the Medicaid expansion for pregnant women and infants in October 1987, a minimum of five prenatal care visits was required for global billing in Florida.
- South Carolina also required 5-13 prenatal care visits for global billing.
- For global billing in Minnesota, only a six-week postpartum visit was required. Extra visits could be billed for high-risk women in addition to the global fee.
- Like Minnesota, North Carolina had no requirement specifying a minimum number of prenatal care visits for global billing, but physicians were required to have seen the patient at least 90 days prior to delivery. Billing extra visits for high-risk women was also permitted.

Three of the states have subsequently changed their physician reimbursement procedures. Both Texas and South Carolina now prohibit global billing. Florida still allows global billing but

the prenatal care visit requirements have been increased; ten visits are now required for low-risk women and fifteen visits for high-risk women.

The other critically important aspects of physician reimbursement are the rates that are paid, and how these relate to prevailing community charges. The greater the discrepancy between prevailing community charges and the Medicaid reimbursement rate the less likely physicians will be to perform Medicaid deliveries, and the greater the health service access problems for Medicaid-eligible women. However, obtaining comparable reimbursement data from the study states is difficult.

In 1987, the National Governors' Association conducted a survey to explore these issues, requesting 1986 (or 1987) reimbursement data from states (Lewis-Idema, 1988). Of the five study states, only Minnesota did not respond. Among the other four states, South Carolina, Florida, and Texas provided 1986 data, and North Carolina provided 1987 data. Global fees in 1986 ranged from \$315 in Florida to \$485 in South Carolina. The corresponding fee-to-community-charge ratios ranged from 17.5 percent in Florida to 48.5 percent in South Carolina. Thus, even in the state with the highest ratio, physicians were reimbursed less than half the prevailing community charge for obstetric services. All four states have subsequently raised their Medicaid fees for obstetrical services. Nonetheless, as can be seen in Table IV.1, the ratio of current fees to 1986/1987 prevailing community charges is still low.

Minnesota, also, has low fees relative to prevailing community charges. The global fee at the end of 1988 was \$500, representing a 10 percent increase over 1987. This figure is low relative to the 1986 prevailing community charge of \$2250 in Minnesota, which was cited by the National Governor's Association.

South Carolina, which no longer employs global billing, provides an interesting case-study of a state that is attempting to use Medicaid reimbursement strategies to enhance services for pregnant women. In 1988, fees for normal deliveries were raised from \$275 to \$500. Prenatal

visits could be billed in addition to this amount, with \$50 being paid for an initial prenatal visit. Fees were raised again in January 1989 to \$600 for a normal delivery, \$100 for an initial prenatal visit, and \$25 for each subsequent prenatal visit, with unlimited prenatal visits allowed. However, in order to qualify for these higher reimbursement rates, physicians are required to provide enhanced services, including parenting and childbirth education and referral to the WIC program. Linking WIC referral to physician reimbursement is a truly innovative feature of South Carolina's Medicaid program; monitoring the implementation and impact of this initiative is important for future policy development, especially now that South Carolina has raised its Medicaid income eligibility standard for pregnant women to 185 percent of the poverty level.

Florida, also, has restructured its physician reimbursement rates to provide greater incentives for comprehensive maternity care, especially for high-risk women. Effective in October 1987, the global fee for low-risk women was raised to \$800 and the global fee for high-risk women was raised to \$1,200. In addition, effective July 1989, a new system was introduced for reimbursing physicians for care provided to high-risk mothers and newborns in the hospital. Inpatient physician services for high-risk women and newborns are now reimbursed using a physician DRG system, rather than on a service-by-service basis.¹⁵

Three important questions for the WIC/Medicaid study emerge from this review of physician reimbursement issues. First, how do the methods and rates of reimbursement, taken in combination, affect the physician costs of a Medicaid delivery? Second, how does reimbursement affect provider participation rates? Third, how do variations in provider participation rates affect the source of prenatal care for Medicaid-eligible pregnant women, and what is the spillover effect on WIC program participation?

¹⁵This reimbursement system was used by the Children's Medical Services (CMS) program to reimburse physicians for care provided in Regional Perinatal Intensive Care Centers (RPICCs) prior to this date.

The first question is difficult to answer a priori, although it is an issue on which the WIC/Medicaid study may indirectly provide some information. Clearly, however, the impact of methods and rates of reimbursement are critically dependent upon when women enroll in prenatal care, the requirements for billing a global fee, the availability of enhanced reimbursement for high-risk women, and the reimbursement differentials between global fees and fees for individual visits plus deliveries. According to the National Governors' Association study, many states that have used global fees for obstetric care are now returning to more fragmented billing procedures, under the theory that more flexible billing will provide a better reflection of the cost of the services provided. (The study uses the example of South Carolina where individual visit billing is now viewed as more cost-effective than global billing.)

Medicaid reimbursement is clearly a major determinant of provider participation but, according to the NGA study, the relationship is complex. In particular, it is the relationship between Medicaid fees, private insurance reimbursement amounts and the physician's usual charge, rather than the absolute level of Medicaid reimbursement, which is the critical determinant of provider participation. Thus, the larger the gap between Medicaid reimbursement rates and prevailing community charges, the lower participation rates are likely to be. The available data on Medicaid reimbursement rates relative to prevailing community charges indicate that low Medicaid reimbursement rates may have been a strong disincentive to physician participation in the study states during the time period of the WIC/Medicaid study, with the problem being particularly severe in Florida.

Physician unwillingness to participate in the Medicaid program encourages low-income women to seek prenatal care in the public sector, where such options are available. Both positive and negative impacts on participation in other programs, including the WIC program, may result. For example, if local health units are both prenatal care and WIC providers, a low-income woman seeking prenatal care will almost always be referred to the WIC program. If, however, because

of excess demand for public sector prenatal care, a long waiting period occurs before a prenatal visit can be scheduled, referral to WIC services may also be delayed. (This problem was mentioned by WIC staff in North Carolina.) Minnesota, in contrast to the other four states, does not have public prenatal care options available in most of the state. Hence, if physicians do not participate in Medicaid, this potentially creates more serious prenatal care access difficulties for Medicaid-eligible women than in other states, and may also limit referrals to WIC. However, no information exists on the extent of this problem.

b. Hospital Reimbursement

Methods for reimbursing hospitals also vary considerably among the study states. Of the five study states, three--Texas, South Carolina, and Minnesota--use diagnosis-related group (DRG) reimbursement systems. North Carolina and Florida both use hospital-specific prospective per diem rates. In general, in states that use a prospective reimbursement system based either upon DRGs or a flat rate per case, hospitals have strong incentives to limit inpatient lengths of stay. The same incentives typically do not exist in states in which hospitals are reimbursed either on a cost or prospective per diem basis. North Carolina, however, uses a cost containment mechanism, which does provide an incentive for early discharge, particularly for high-volume, high-cost providers. Under the "target day" system used in North Carolina, each hospital is given a target ceiling on Medicaid inpatient days per annum. Hospitals exceeding their target days have all subsequent Medicaid inpatient days reimbursed at the mean Medicaid per diem for all hospitals in the state. Inpatient days for pregnant women and infants who are Medicaid eligible as a result of the OBRA-86 and OBRA-87 expansions, and all neonatal intensive care days, are excluded from the reimbursement reduction. (Obviously, hospitals with per diems below the state mean are not affected.)

All three of the DRG states in the WIC/Medicaid study make allowances for high-cost cases, albeit in different ways. The Minnesota system allows for day and cost outlier payments

for patients whose lengths of stay or costs exceed preestablished norms, while Texas and South Carolina have both made specific provisions to address the problems of reimbursement for high-cost newborns. In Texas, newborn care is reimbursed on a cost basis, and in South Carolina newborn care is reimbursed on a per diem basis. Thus, depending upon the outlier thresholds, the Minnesota system may still provide incentives for early discharge, but in South Carolina and Texas incentives for early discharge of high-cost newborns appear to be no different than in Florida or North Carolina.¹⁶

5. HMO Participation

Ideally, all Medicaid births in the study states in the appropriate time period would be included in the WIC/Medicaid study.¹⁷ This would encompass births to Medicaid-eligible women who are enrolled in prepaid health plans as well as those who receive their care from fee-for-service physicians or public clinics. Unfortunately, health maintenance organizations (HMOs) and other prepaid health plans typically provide little or no information on the service utilization patterns or costs of their Medicaid enrollees. Furthermore, while WIC participation may affect the costs of care for Medicaid-eligible pregnant women and newborns who are enrolled in HMOs, there will be no short-term effect on Medicaid expenditures per se, since Medicaid pays a flat capitation amount per enrollee. For both these reasons, therefore, HMO enrollees will be excluded from the analysis. The impact of this on the universe of Medicaid births in the study states is explored here.

¹⁶The recent changes in Medicaid reimbursement for physicians in Florida do, however, provide incentives for early discharge of high-risk women and newborns. This is not a concern for the WIC/Medicaid study, since the physician DRG reimbursement system for high-risk women and infants was not implemented until 1989.

¹⁷For Florida, Minnesota, North Carolina, and South Carolina the study period is 1987. For Texas the study period is the first half of 1988.

Only two of the five study states are affected by the exclusion of HMO enrollees, since no HMO participation by Medicaid recipients occurs in North Carolina, South Carolina, or Texas. Minnesota, however, has Medicaid 1115 Waiver Demonstration project to enroll Medicaid recipients in prepaid health plans. Originally the demonstration was intended to apply to all Medicaid eligibility categories but, subsequently, the disabled were dropped from the project. Three counties are participating in the demonstration. In Hennepin County (Minneapolis) 35 percent of the Medicaid population is enrolled in prepaid health plans. In Dakota County (suburban) and Itasca County (rural) all Medicaid recipients are participating. In addition, a small number of voluntary HMO enrollments occur in Hennepin, Ramsey (St. Paul) and Lake Counties. Overall, approximately 25,000 Medicaid recipients, out of a total Medicaid population of 278,000 statewide, are enrolled in prepaid health plans. This represents 9 percent of the Medicaid population statewide. In Florida, 44,000 Medicaid recipients were enrolled in HMOs in 1988, representing 12.5 percent of AFDC Medicaid recipients statewide and 33 percent of AFDC recipients in Dade County. Thus, a significant proportion of the Medicaid births in both Minneapolis and Miami may be excluded from the study, but the impact of this cannot be assessed.

6. Special Program Initiatives for Pregnant Women and Infants

In many states the opportunities afforded by the OBRA-86 and OBRA-87 initiatives have served as a catalyst for the development of a broad range of program interventions for pregnant women and infants. Of the five study states, Florida, Minnesota, North Carolina, and South Carolina have all developed Medicaid-related perinatal programs to provide enhanced perinatal services to Medicaid-eligible pregnant women and newborns. In South Carolina's case, however, the enhanced program predated the OBRA-86 expansions. All three states' programs are briefly summarized here.

- **Florida: Reimbursement Enhancements for High-Risk Women and Infants.** Enhanced physician reimbursement for high-risk women was introduced in conjunction with the OBRA-86 expansion for pregnant women and infants. Subsequently, in conjunction with the OBRA-87 expansion, a special disproportionate share reimbursement system was introduced for neonatal intensive care centers. At the same time, the physician DRG system for care of infants in neonatal intensive care centers was introduced.
- **Minnesota: Prenatal Care Initiative.** This initiative was undertaken in conjunction with the OBRA-87 expansion for pregnant women and infants. Medicaid reimbursement is now provided for prenatal risk assessments and enriched services for high-risk pregnant women. In addition, enhanced reimbursement is given to providers accepting high-risk pregnant women.
- **North Carolina: Baby Love Program.** This initiative was undertaken in conjunction with the OBRA-86 expansion for pregnant women and infants. Medicaid-reimbursed services were expanded to include case management, childbirth and parenting classes, and home visits for high-risk pregnant women. In addition, a statewide outreach program was developed in conjunction with the implementation of presumptive eligibility.
- **South Carolina: High Risk Channeling Project.** This program for high-risk Medicaid-eligible pregnant women and infants was established under a Medicaid freedom-of-choice waiver. Services are provided to high-risk women and infants who are referred to the appropriate level of care. The project also provides case management services throughout the perinatal period (through the first year of life).

The Minnesota initiative was not implemented until 1988 and, therefore, will not affect the WIC/Medicaid study at all. In addition, the impact of the Baby Love Program in North Carolina on the study is likely to be small; the program was implemented in the last three months of 1987, and such initiatives typically require considerable start-up time. The high-risk channeling project in South Carolina, however, was initiated before 1987, and was in effect throughout the whole project year. As a result of this project, Medicaid-eligible high-risk pregnant women may have received more intensive, and possibly higher-cost, prenatal care services than they would have done in the absence of the waiver. In addition, more Medicaid-eligible high-risk women and infants may have received services in regional perinatal centers. In consequence, rates of adverse,

high-cost, pregnancy outcomes to Medicaid-eligible women may have been lower they would have been in the absence of the waiver. Conversely, survival rates of very high risk newborns may have been greater than they would otherwise have been.

In addition to these special Medicaid initiatives, some states have taken advantage of the OBRA-86 and OBRA-87 options and converted existing state-funded programs for pregnant women and children to Medicaid programs. In Florida, for example, the Regional Perinatal Intensive Care Center (RPICC) and the Improved Pregnancy Outcome (IPO) programs, both of which were previously state-funded, are now mostly Medicaid-funded, effective July 1989. (For details of these programs, see the next chapter.)

C. SUMMARY

In this chapter, major features of Medicaid programs in the study states have been reviewed. Of necessity, one is attempting to portray a moving target, since Medicaid programs for pregnant women and infants having been changing rapidly, but at different rates and in different ways in individual states.

From the perspective of program eligibility, prior to the OBRA-86 initiatives implemented by South Carolina, North Carolina and Florida in the last quarter of 1987, only Minnesota had a relatively high income eligibility standard. In the other four states a pregnant woman had to have a family income below fifty percent of the poverty level in order to qualify for Medicaid, and in Texas the income eligibility level was one-third of the poverty level. Thus, significant differences existed in Medicaid income-eligibility standards in the study states, which may affect the empirical study results.

In spite of having a higher Medicaid income eligibility standard, Minnesota did not have a high percentage of births to women on Medicaid relative to the other states. In terms of provider reimbursement, Minnesota is no different from the other states; all five states have low reimbursement rates for obstetrics relative to prevailing community charges. In addition, two of

the study states--Texas and Florida--had service limitations in effect during the study period which may have limited Medicaid expenditures for high-cost newborns.

Increasingly, states are attempting to provide enriched prenatal services for Medicaid-eligible pregnant women and infants, especially those at high-risk. Among the study states, however, only South Carolina's program, which was implemented prior to 1987, is likely to have an impact on the WIC/Medicaid study results.

V. OTHER PROGRAMS FOR PREGNANT WOMEN AND INFANTS

The Congressional mandate for this study requested that the benefits of WIC prenatal participation be analyzed in terms of both Medicaid and indigent care costs for pregnant women and newborns. However, determining, or even defining, indigent care costs for pregnant women and newborns is difficult, since many of these costs are borne by the private sector and seldom documented. This is particularly the case with delivery and newborn services, for which states have traditionally provided relatively little funding other than through Medicaid, allowing hospitals to bear the brunt of uncompensated care costs. In addition, the limited national data that are available on uncompensated care are typically given in terms of charges which provide a somewhat distorted picture of the magnitude of uncompensated care costs.

Gold et al. (1987) estimated that, in 1985, maternity and newborn care was the biggest single source of uncompensated care in hospitals, accounting for \$2.0 billion, or 27 percent, of the estimated \$7.4 billion in uncompensated hospital charges nationwide. Of this amount, 3 percent was accounted for by charity patients, 40 percent represented bills for Medicaid patients for services not reimbursed by Medicaid, 34 percent represented bills that were unpaid when there was insufficient private insurance, 21 percent was accounted for by bills that were unpaid when the patient was billed directly, and 1 percent was for bills unpaid by coverage from other sources. Obviously, many of these uncompensated charges are not necessarily for care provided to low-income women. However, there is no doubt that high-risk low-income pregnant women and newborns have placed a very large indigent care burden on hospitals in general, and on public hospitals in particular, across the country.

Unfortunately, comparable data are not generally available at the state level. Nor is it known how the maternity-related uncompensated care burden is changing as a result of Medicaid program expansions for pregnant women and infants. Certainly, the expansion of Medicaid

eligibility should reduce the number of maternity cases with no reimbursement source, but the proportion of billed charges that is reimbursed by Medicaid is probably still relatively low in many states.

More state-specific information is available on prenatal care expenditures and services for low-income women, because states are directly involved in the provision and/or funding of these services through local health departments. Nonetheless, information on the prenatal care activities and costs of some of the important prenatal care providers for low-income women, such as Community and Migrant Health Centers, is also difficult to obtain. Gold et al. report that nationwide, in 1986, approximately 660,000 women received prenatal care in publicly-supported clinics. Almost one-third of these women received their care in Community and Migrant Health Centers, with the remaining two-thirds receiving their care in Maternal and Child Health clinics located primarily in state, county, and city health departments. Since WIC services are typically provided through local health departments and nonprofit community-based providers, knowledge of the prenatal care system that exists for low-income women is important for understanding the factors that affect WIC participation.

In this chapter, programs and options for low-income pregnant women and infants in the study states are discussed. Possibly the most significant of these are Title V Maternal and Child Health Services and Handicapped Children's Services, but there are many others, including: (1) financing programs to reimburse medical care provided to all non-Medicaid eligible persons below a certain income level, not pregnant women and infants exclusively; (2) special state and/or federally funded programs for pregnant women and infants, many of which may be superseded by Medicaid initiatives for pregnant women and infants under OBRA-86 and OBRA-87; and (3) services provided by other providers for low-income populations including Community Health Centers (CHCs), Migrant Health Centers (MHCs), and public hospitals. However, because of the lack of information on the services provided to low-income pregnant women and infants by

CHCs, MHCs, and public hospitals in the study states, the main focus of the chapter is on Title V programs, state-funded medical care financing programs, and other special programs for pregnant women and infants which use varying combinations of federal, state, and local funding. Details of these programs are summarized in Table V.1.

A. MATERNAL AND CHILD HEALTH SERVICES

States provide maternal and child health services for low-income pregnant women and children through funding provided through the Title V Maternal and Child Health (MCH), Block Grant, supplemented by state and local funds. As can be seen in Table V.1, the relative magnitude of Maternal and Child Health expenditures in the five study states varies tremendously, with expenditures per live birth being much higher in North and South Carolina than they are in Minnesota or Texas. There is also great variation between the four southern states and Minnesota in the proportion of these expenditures that are financed by the MCH Block Grant; in Florida, North Carolina, South Carolina, and Texas less than 25 percent of reported MCH expenditures were financed by the MCH Block Grant, compared to 65 percent in Minnesota.¹⁸

These differences are also reflected in the services provided through maternal and child health programs. In the four southern states, local health departments are generally direct providers of prenatal care. In North Carolina, local health units contract with the state to provide the services, whereas in South Carolina and Florida, local health units are direct arms of the state. As with the provision of WIC services, Texas has a mixed system dependent, in part, upon county population sizes. There are 71 autonomous health departments in the more populous counties

¹⁸The situation in Texas is not wholly clear. The figures in Table V.1 are derived from a Public Health Foundation (1988) report on state public health expenditures. The report indicates that one third of the MCH Block Grant in Texas was used for personal health care in local health departments. These expenditures have not been indicated in our estimates of maternal and child health expenditures.

TABLE V.1
CHARACTERISTICS OF OTHER PROGRAMS FOR PREGNANT WOMEN
AND INFANTS IN THE STUDY STATES

	Florida	Minnesota	North Carolina	South Carolina	Texas
MATERNAL AND CHILD HEALTH SERVICES					
Maternal and Child Health (MCH) Expenditures (\$ million, 1986)	80.7 (This is a combined figure for MCH and Handicapped Children's Services [HCS].)	6.2	51.2	28.4	31.2
Expenditures per Live Birth (\$)	481 (combined MCH and HCS)	94	568	549	102
Percent financed by MCH Block Grant	19 (combined MCH and HCS)	65	21	21	24
Relationship of Local Health Departments to State	Arm of State	Autonomous	Autonomous	Arm of State	Autonomous (Mostly)
Prenatal Care Provision by Local Health Departments	Yes	No (Mostly)	Yes	Yes	Yes
Public Prenatal Care Availability Statewide	Yes	No (Very little subsidized prenatal care is available.)	No (12 counties lacked subsidized prenatal care in July 1988.)	Yes	No (55 counties in 1985 needed subsidized prenatal services. By 1988 MCHIA program was providing care in 36 of these.)
HANDICAPPED CHILDREN'S SERVICES					
Handicapped Children's Expenditures, (\$ million, 1986)	(See MCH)	4.3	12.1	8.8	30.2
Payment for High-Risk Newborns	Reimburses NICU services and follow-up care.	Reimburses small amount of NICU care. Program is capped at \$15,000.	Does not reimburse NICU services, but does pay for services after discharge.	Does not reimburse NICU services, but does pick up some other costs for low-income high-risk newborns.	Does not reimburse NICU services, but pays for services 14 days after discharge.

Table V.1 (continued)

	Florida	Minnesota	North Carolina	South Carolina	Texas
<u>STATE-FUNDED MEDICAL CARE FINANCING PROGRAMS</u>	No	Yes Provides coverage for Medicaid-eligible people meeting same income and resource standards as Medicaid. Total expenditures, were \$58 million for 55,000 recipients, in 1985.	No	No	No
<u>OTHER SPECIAL PROGRAMS FOR PREGNANT WOMEN AND INFANTS</u>	<u>Improved Pregnancy Outcome Program</u> Provides basic multidisciplinary prenatal care to low-income women, up to 200 percent of the poverty level on a sliding scale. <u>Regional Perinatal Centers</u> Provides services for low-income, high-risk pregnant women and infants up to 150 percent of poverty. Budget: \$29.4 million in 1988.	<u>Pre-Block Grant Special Projects</u> Provide comprehensive health services for low-income and/or high-risk women and children, mostly in Minneapolis and St. Paul. Budget: \$4.9 million for 1988/89 biennium	<u>State-Funded Perinatal Program</u> Prior to OBRA-86, provided deliveries and newborn care for Medicaid-eligible pregnant women and infants below 60 percent of poverty.	<u>High Risk Perinatal Program</u> Provides prenatal, delivery and postpartum services for high-risk Medicaid-eligible women below 150 percent of poverty in approved perinatal center.	<u>Maternal Improvement Health Insurance Act (MIHIA)</u> Provide prenatal care and delivery services for high-risk Medicaid-eligible women below 100 percent of poverty. Also pays for neonatal intensive care for high-priority infants. Budget: \$22.2 million for 1986/87 biennium
			<u>High Priority Infant Program</u> Provides tracking, support, and counseling for infants at risk for developmental delay.	<u>Low Birthweight Prevention Project</u> Provided prenatal care and low birth-weight intervention for women below 150 percent of poverty between 1986 and 1988.	<u>Priority Infant Tracking Program</u> Provides tracking of high-risk infants through first year of life.

SOURCES: (1) Site visits, state documents, and interviews with state staff; (2) Public Health Foundation. Public Health Agencies 1988: An Inventory of Programs and Block Grant Expenditures, Washington, D.C.: May 1988.

which contract with the state to provide services. Smaller counties in Texas may have MCH administered and funded services, or MCH may contract with private providers in these counties.

In spite of efforts to provide prenatal care for low-income women, the four southern states differ also in the extent of public prenatal care availability. North Carolina, for example, is facing increasing problems because of physician withdrawal from public health clinics. As of July 1988, 12 North Carolina counties had no subsidized prenatal care. Similarly, in Texas, the Department of Health identified 55 counties in 1985 that were in need of prenatal care services. By 1988, the state-funded Maternal Improvement Health Insurance Act (MIHIA) program was providing prenatal care in 36 of these counties. Florida and South Carolina, in contrast, have subsidized prenatal care available in almost every county.

As previously mentioned, Minnesota has a different public health philosophy than the other four states in this study, and is not strongly oriented towards direct service provision. Local health units in Minnesota can be direct service providers if they wish. However, with some notable exceptions, most local health units choose not to do so, preferring to concentrate their MCH efforts more on counseling and education programs. Consequently, outside the Twin Cities, very little public prenatal care is available in Minnesota.

B. HANDICAPPED CHILDREN'S SERVICES

Handicapped Children's Services (HCS) reimburse providers for medical services provided to low-income children with serious handicapping conditions. Like MCH services, HCS programs are partially funded out of the MCH Block Grant but, again, there is considerable variation in the percentage of state's expenditures that are funded by the Block.

HCS programs are of concern for the WIC/Medicaid study to the extent that they are paying for care for high-risk newborns during the first 60 days of life. Thus, for example, insofar as states reimburse neonatal intensive care (NICU) for uninsured or indigent newborns out of HCS funds rather than Medicaid, Medicaid expenditures will underestimate the costs of care for

these infants that are being reimbursed by public programs. However, discussions with program staff from the study states indicate that they typically make every effort to limit HCS expenditures for NICU services per se, preferring to use HCS funds for subsequent health care needs of seriously handicapped infants and children.

In three of the study states--North Carolina, South Carolina, and Texas--HCS does not pay for any NICU services, but the program does pick up some of the costs of low-income high-risk newborns that are not covered by Medicaid. In Florida and Minnesota, HCS will pay for both NICU services and follow-up care. However, in Minnesota, HCS payments are capped at \$15,000, so low birthweight infants quickly spend down and become Medicaid-eligible.

C. STATE-FUNDED MEDICAL CARE FINANCING PROGRAMS

In order to expand medical care coverage for low-income people, several states have developed State-only Medicaid programs. These programs vary widely, but are generally intended to provide the equivalent of Medicaid coverage for specified groups of individuals who are not eligible for Medicaid according to the federal criteria. Minnesota is the only one of the five study states to have a state-funded general assistance medical care program (GAMC), which provides medical care coverage for persons who are not Medicaid-eligible but meet the same income and resource standards. In 1985, this program paid for services for approximately 55,000 recipients, some of whom were pregnant women and infants. Total GAMC expenditures in 1985 were \$58 million. As Medicaid income eligibility for pregnant women has expanded in Minnesota, the role of the GAMC program in paying for maternal and newborn care has progressively diminished. A few pregnant women, aliens for example, are still covered by GAMC rather than Medicaid, but the numbers are inconsequential. In addition, as previously mentioned, Minnesota is now using state funds to provide Medicaid coverage for all Medicaid-ineligible children through age eight below 185 percent of the poverty level.

The Minnesota program enables low-income individuals to become eligible for state-reimbursed medical care coverage that is very similar to Medicaid coverage. South Carolina, in contrast, has a Medically Indigent Assistance Care fund, which is used to reimburse hospitals for indigent care. In order to be eligible for funding, counties have to match the state funds on a dollar-for-dollar basis. Reimbursements are made from the \$15 million fund on a first-come-first-serve basis. In the past, most of the expenditures from this fund have been for deliveries. However, with the rapid expansion of income-eligibility for pregnant women and infants in South Carolina, the proportion of the fund used for deliveries will probably decrease.

Two programs exist in Florida to pay for health care for the medically indigent. The Health Care Responsibility Act (HCRA) obligates counties to pay up to \$4.00 per resident to pay for out-of-county hospital care, and a joint state and county program pays for inpatient care for Medicaid-ineligible indigent people, up to a maximum of \$10 million a year.¹⁹ However, as in other states, low-income maternal and newborn care in Florida is now largely covered by Medicaid, and so these programs should be paying for very little maternity-related care. Neither program is of concern for the WIC/Medicaid project, since both were effectively implemented after 1987. (According to state staff, the HCRA program was in existence prior to 1988, but was not enforced much until 1988 when a cap was placed on a county's obligation.)

D. OTHER SPECIAL PROGRAMS FOR PREGNANT WOMEN AND INFANTS

In addition to Medicaid-related initiatives for pregnant women and infants, all five of the study states have special programs for low-income pregnant women and newborns which, typically, predate the OBRA-86 and OBRA-87 expansions. In general, these programs were designed to focus on high-risk women and infants and/or those who were poor but ineligible for Medicaid. Obviously, since states are using state, local, and federal block grant funds to support these

¹⁹In FY 1990, this program has an appropriation of \$3 million. Whether the program will be reauthorized after June 30, 1990 is uncertain.

programs, as Medicaid income eligibility expands, there are strong incentives to shift as many women and infants as possible out of these programs and into Medicaid. Insofar as the programs were primarily for financing care, they may be discontinued in the future because they are no longer needed. In some instances, however, programs have both financing and service delivery components, and the latter may be critically important for low-income women, regardless of whether they are Medicaid-eligible or not.

In this section, a brief overview of key program initiatives in the five study states is provided. These programs are not specifically Medicaid-related, as were those described in the last chapter. Rather, they are perinatal initiatives to improve access to care for all low-income pregnant women and infants, which typically pre-dated the recent Medicaid program expansions.

- Florida

Improved Pregnancy Outcome (IPO) Project. The IPO project provides basic multidisciplinary prenatal care to low-income women through local health departments or through contracts with private providers. IPO teams are sent to counties in which no other source of prenatal care is available. All pregnant women below 100 percent of the poverty level are eligible for these services, and some counties now provide care to pregnant women up to 200 percent of the poverty level. In counties providing care to women above the poverty level, a sliding scale fee system is used. The program, which uses a combination of federal, state, and local funds, is now largely funded by Medicaid.

Regional Perinatal Intensive Care Centers (RPICC). This is a state-funded program to provide services to low-income high-risk pregnant women and newborns through regional perinatal intensive care and step-down centers. The program pays for deliveries, plus neonatal intensive care, step-down services, and developmental evaluations for critically ill low-birthweight newborns. The total budget was \$29.4 million in FY 1988. In 1989, most of the state RPICC funds were shifted to provide Medicaid matching dollars, and the Medicaid program was expanded to cover all pregnant women and infants below 150 percent of the poverty level. Those RPICC services that are eligible for Medicaid reimbursement are now covered by Medicaid, and other RPICC services are paid for directly by the program.

- Minnesota

Pre-Block Grant MCH Special Projects. As previously noted, little direct service provision by local health departments occurs in Minnesota, and most of the MCH block grant funds are distributed to local health units for programs that focus on education and counseling activities. However, some direct service provision projects still exist which were established prior to the enactment of the Maternal and Child Health Block Grant in 1981. Total funding for these programs for the 1988/89 biennium was approximately \$4.9 million. The two largest of these projects, accounting for 90 percent of the funds, are in Minneapolis and St. Paul. Comprehensive health services are provided to low-income or high-risk women, infants, and children, in the Minneapolis public health center and the St. Paul/Ramsey hospital, as well as in community centers and high schools.

- North Carolina

State-Funded Perinatal Program. Prior to the OBRA-86 Medicaid expansions, this program paid for deliveries and newborn care for Medicaid-ineligible pregnant women and infants below 60 percent of the poverty level. The program paid for approximately 5,000 deliveries a year. Most of the funds for this program were subsequently used to provide Medicaid matching funds for the OBRA-86 expansions. However, a Health Directors' Fund of approximately \$1 million remains, which can be used by local health departments to pay for perinatal services. The money is primarily used for outpatient testing and, also, for hospital down payments for deliveries.

High Priority Infant Program. This is a state-funded program to provide tracking, family support, and counseling for infants at risk for developmental delay. These infants are primarily identified through newborn nurseries.

- South Carolina

High Risk Perinatal Program. This is a state-funded program to provide prenatal, delivery, and postpartum services for high-risk, Medicaid-ineligible women below 150 percent of poverty, who are receiving services in an approved high-risk clinic or service delivery system. With the recent Medicaid expansion to 185 percent of poverty, women who previously would have been enrolled in this program will presumably now be Medicaid-eligible.

Low Birthweight Prevention Project. This was a federally funded project through the Special Projects of Regional and National Significance (SPRANS) program. Operational between 1986 and 1988, the project provided prenatal care and low birthweight intervention for women below 150 percent of the poverty level.

Priority Infant Tracking Program. This is state-funded program to track high-risk infants through the first year of life to ensure that they receive routine well-baby care and immunizations.

- **Texas**

Maternal Improvement Health Insurance Act (MIHIA). The act creating the MIHIA program, which is entirely state-funded, was passed in 1986. Initially the program paid for prenatal care and delivery services for high-risk, Medicaid-ineligible women, between 34 percent and 100 percent of the poverty level. With the recent Medicaid expansion to 130 percent of poverty for pregnant women and infants, the role of the MIHIA program has been considerably reduced. MIHIA now only pays for pregnant women below 130 percent of poverty who are ineligible for Medicaid because they do not meet the resource limits. The program also pays for neonatal intensive care for high priority infants. Total funding for the program was \$22.2 million for the 1986-87 biennium.

E. DISCUSSION

This chapter has provided an overview of programs for low-income pregnant women and infants in the study states. As is readily apparent, the role of these programs is changing rapidly as Medicaid coverage for pregnant women and infants expands. States that have been using state and local funds to pay for medical care for low-income pregnant women and newborns can obtain a far greater return on these dollars by using them to match federal Medicaid dollars and increasing Medicaid coverage for pregnant women and infants. Increasingly, therefore, Medicaid programs are subsuming state-funded indigent care programs for pregnant women and infants.

As these Medicaid expansions occur, significant reductions in the indigent care burden of hospitals can be expected, since maternity services account for such a large percentage of unreimbursed charges. The magnitude of the impact, however, will depend on the degree to which Medicaid programs can close the gap between Medicaid reimbursement rates and prevailing community charges.

Publicly-funded prenatal care providers for low-income women, such as local health departments and Community and Migrant Health Centers, may also experience a reduction in unreimbursed care. Moreover, their caseload may change if previously uninsured women, who

are now Medicaid-eligible, seek care in the private sector. For many states, key policy issues are the extent to which this shift in the location of prenatal care will occur and the corresponding implications for prenatal WIC participation. A closely related issue is whether local health departments will continue to provide prenatal care services as Medicaid eligibility expands. Because of the difficulty they experience in obtaining access to care, many newly Medicaid-eligible pregnant women may continue to seek care in local health departments and Community and Migrant Health Centers, with the financial responsibility shifting to Medicaid.

VI. CONCLUSIONS

This report has provided a broad overview of the target populations and the key programs for low-income pregnant women and infants in the study states. The contrasts between the high-risk populations and the rates of adverse pregnancy outcomes, as well as between the structure and characteristics of the key programs, are striking. Partly because of the much higher risks of adverse pregnancy outcomes in the black population, the three southeastern states have considerably higher infant mortality rates than Minnesota or Texas. Texas has problems of a different kind. While reported infant mortality rates are relatively low, Texas has one of the highest rates of inadequate prenatal care utilization of any state in the country. As was pointed out in the report, this is in part a reflection of low prenatal care utilization among Hispanic women, a factor that is very important in the WIC/Medicaid study.

The information that was gathered from the site visits to the study states highlighted the pivotal role of the WIC program in the states' maternal and child health activities. However, the extent of state control over WIC activities varied considerably, according to the degree of independence of local health departments. WIC participation also varied both within and between states. In a state with a strong private sector orientation, such as Minnesota, WIC participation is critically dependent upon private physician referrals, which appear to present a problem in all states. Nonetheless, as was described in Texas and North Carolina, states or localities in which most prenatal care to low-income women is provided through the public sector also face problems if maternity clinic bottlenecks impede WIC prenatal participation. In spite of such problems, all five states are experiencing rapid growth in the number of WIC participants as a result of program expansions made possible by infant formula rebate programs.

Medicaid programs in all the study states have been changing rapidly over the past couple of years, as the states implement new initiatives for pregnant women and infants under OBRA-86

and OBRA-87. These initiatives have been particularly significant in the southern states in which AFDC-related income eligibility standards were extremely low. Not only are the income eligibility criteria and processes changing, but states are developing new services and program initiatives for Medicaid-eligible pregnant women and newborns, with particular emphasis on those who are identified as high-risk. A major emphasis of many of these Medicaid enhancements—such as presumptive eligibility, continuous eligibility, and higher reimbursement rates—is to facilitate access to the appropriate level of prenatal care services early in pregnancy. In addition, great efforts are being made to coordinate programs for low-income women more effectively, including improving referral patterns between the Medicaid program and WIC. In this regard, the new program being implemented by South Carolina, which links enhanced physician reimbursement for obstetrics to WIC referrals, is particularly worthy of note.

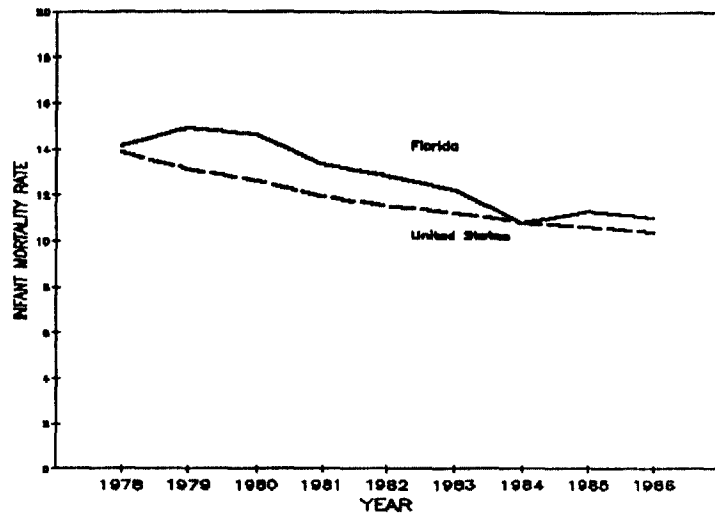
In addition to their regular MCH activities, the five states have developed a variety of other programs to improve access to care for low-income women and infants. These programs, too, are now being reassessed as more pregnant women become eligible for Medicaid. The future role for government agencies in the direct provision of care for low-income pregnant women will depend, to a considerable extent, on the private sector response to the new Medicaid enhancements. If more states become like Minnesota, and rely more heavily on the private sector for the provision of prenatal services for low-income women, initiatives to improve WIC referrals, such as South Carolina's, may be needed.

REFERENCES

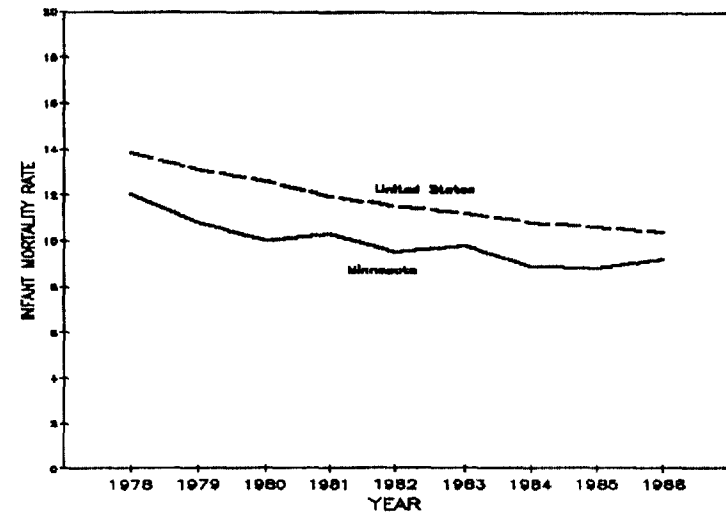
- Buescher, Paul. "Linking Administrative Data Files: Research and Policy Applications in a State Government Setting." Proceedings of the Social Statistics Section, American Statistical Association, 1988.
- Burghardt, John, Barbara Devaney, and Jennifer Schore. "Feasibility Report: Database Construction for the Study of Savings in Medicaid and Indigent Care for Newborns from Participation in the WIC Program." Princeton, NJ: Mathematica Policy Research, Inc., 1990.
- Devaney, Barbara, Jennifer Schore, and Valerie Cheh. "Feasibility Report: Methodology for the Study of Savings in Medicaid and Indigent Care for Newborns from Maternal Participation in the WIC Program." Princeton, NJ: Mathematica Policy Research, Inc., 1989.
- Gold, Rachel, Asta-Maria Kenney, and Sushula Singh. Blessed Events and the Bottom Line: Financing Maternity Care in the United States. New York: The Alan Guttmacher Institute, 1987.
- Hughes, Dana, Kay Johnson, Sarah Rosenbaum, and Joseph Liu. The Health of America's Children: Maternal and Child Health Data Book. Washington, D.C., Children's Defense Fund, 1989.
- Institute of Medicine, Committee to Study the Prevention of Low Birthweight. Preventing Low Birthweight. Washington, D.C.: National Academy Press, 1985.
- Kleinman, Joel and Samuel Kessel. "The Recent Decline in Infant Mortality." Health United States 1980. Hyattsville, MD: U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics, 1980.
- _____. "Racial Differences in Low Birthweight: Trends and Risk Factors." New England Journal of Medicine, vol. 317, no.12, Sept. 1987.
- Lewis-Idema, Deborah. Increasing Provider Participation. Washington, D.C.: National Governors' Association, 1988.
- Lia-Hoagberg, Betty, Peter Rode, Kenyari Benfield, and Catherine Skovholt. Barriers and Motivators to Prenatal Care: Experiences of Low-Income Women. Minneapolis, August 1988.
- National Center for Health Statistics. Health, United States 1986. DHHS Pub. No. (PHS) 87-1232. Public Health Service. Washington, D.C.: U.S. Government Printing Office, 1986.
- _____. "Advance Report of Final Mortality Statistics, 1986." Monthly Vital Statistics Report, vol. 37, no. 6, Supplement, DHHS Pub. No. (PHS) 88-1120. Public Health Service. Hyattsville, MD, September 1988.

Infant Mortality Rates, All Races, 1978-1986
Participating States

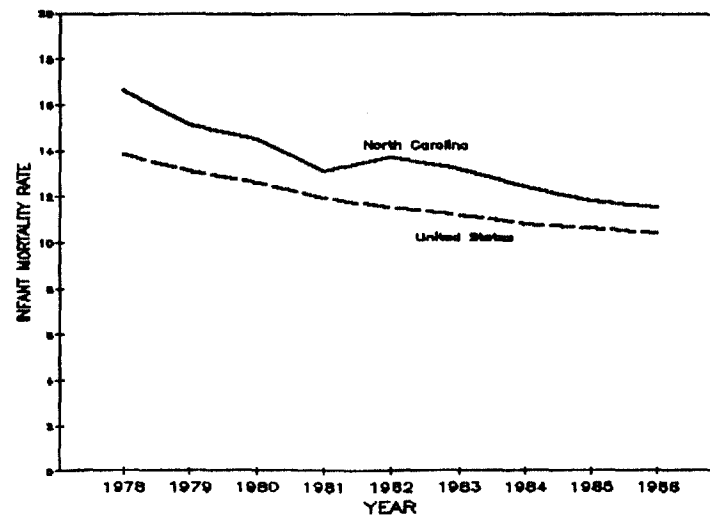
FLORIDA



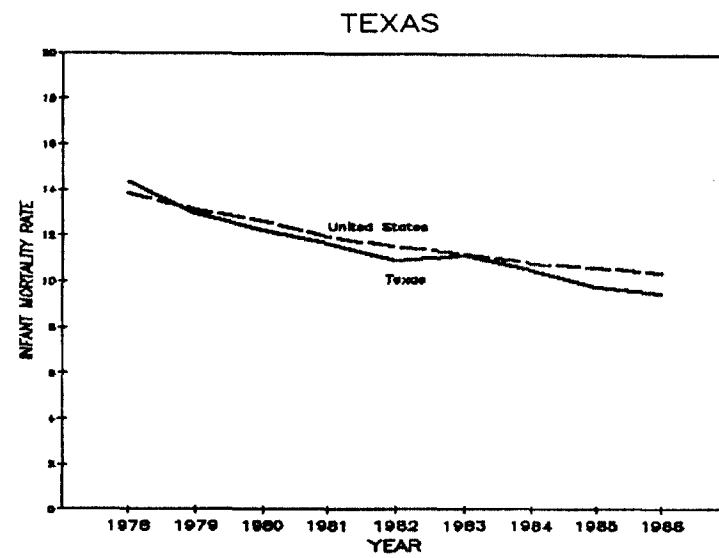
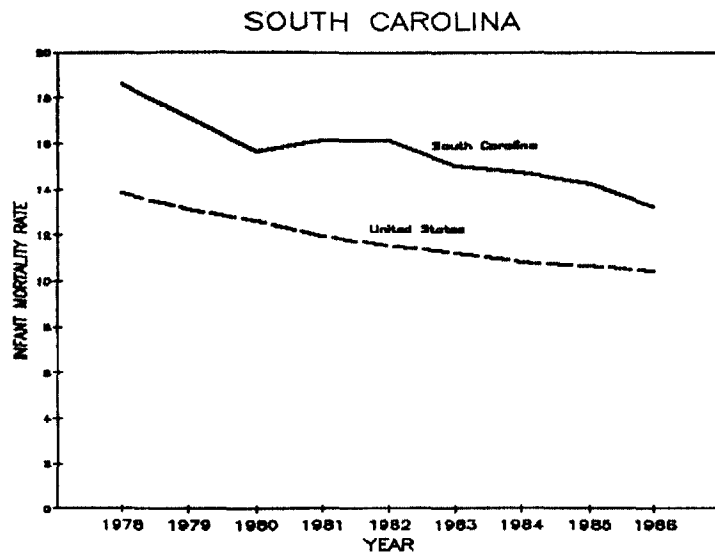
MINNESOTA



NORTH CAROLINA

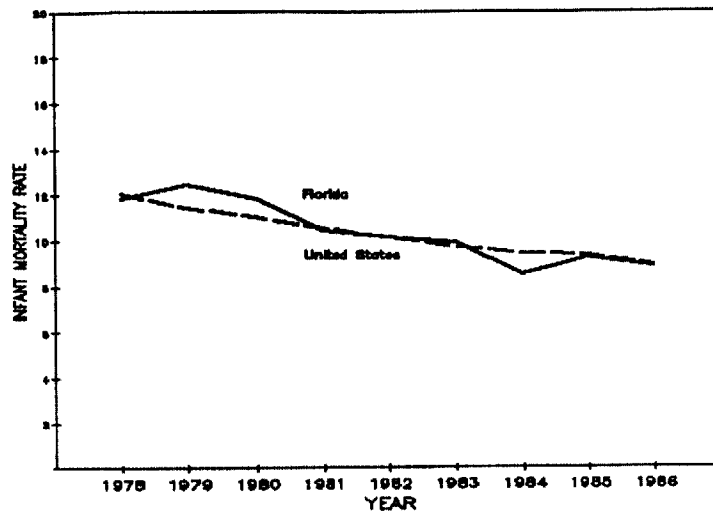


Infant Mortality Rates, All Races, 1978-1986
Participating States (continued)

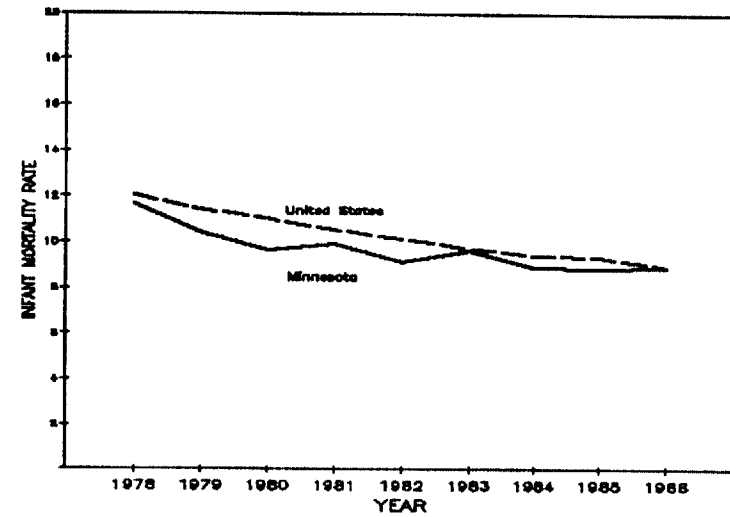


Infant Mortality Rates, White, 1978-1986,
Participating States

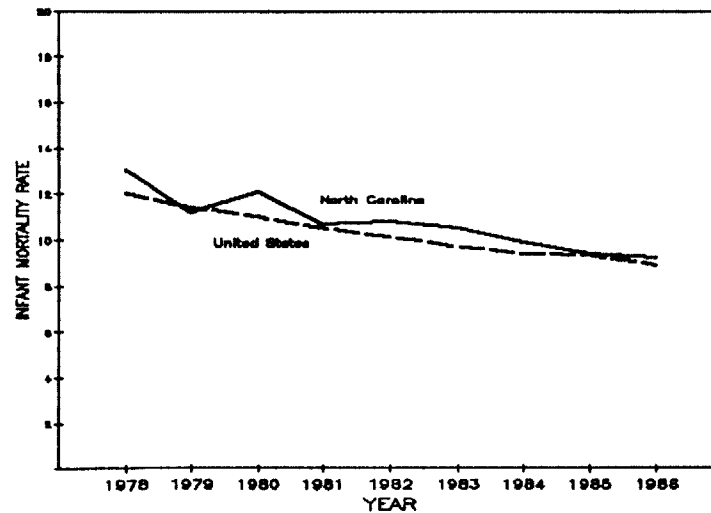
FLORIDA



MINNESOTA

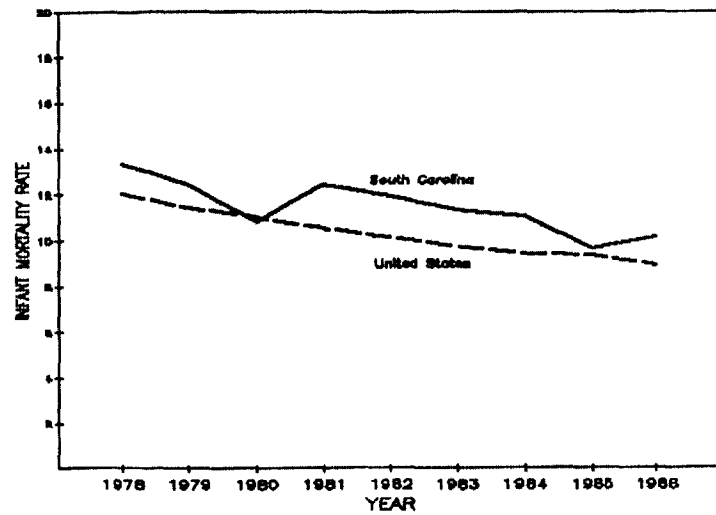


NORTH CAROLINA

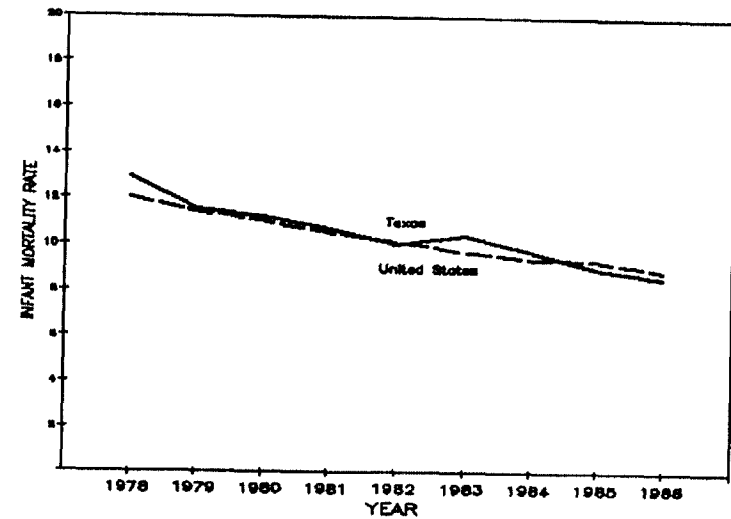


Infant Mortality Rates, White, 1978-1986,
Participating States (continued)

SOUTH CAROLINA

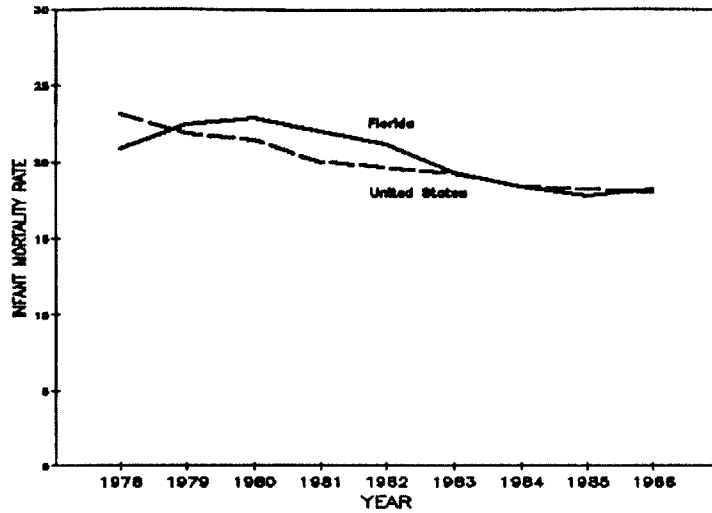


TEXAS

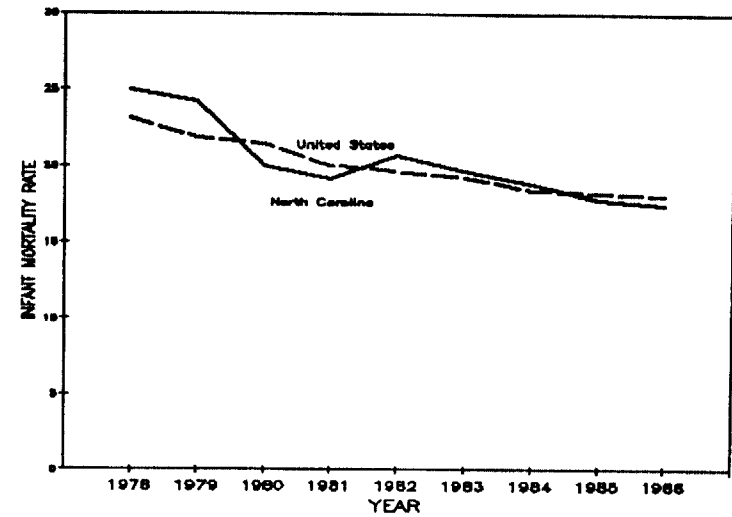


Infant Mortality Rates, Black, 1978-1986
Selected Participating States

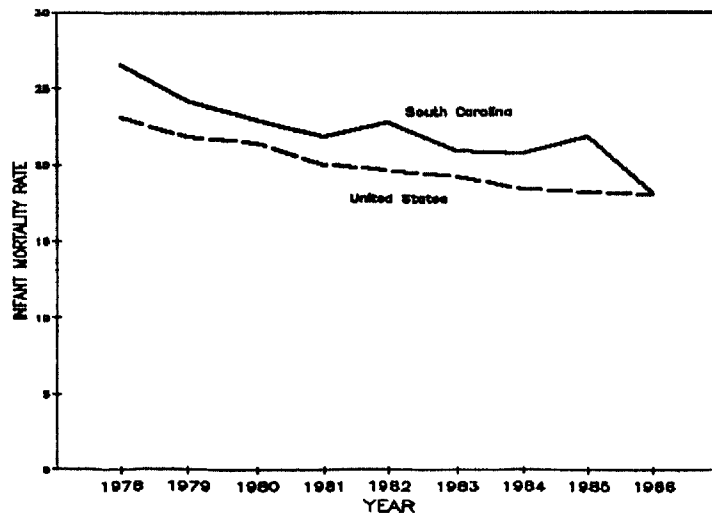
FLORIDA



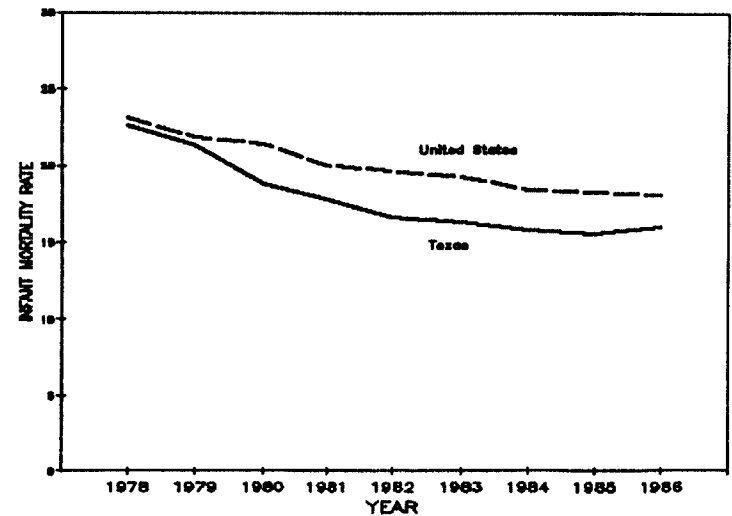
NORTH CAROLINA



SOUTH CAROLINA

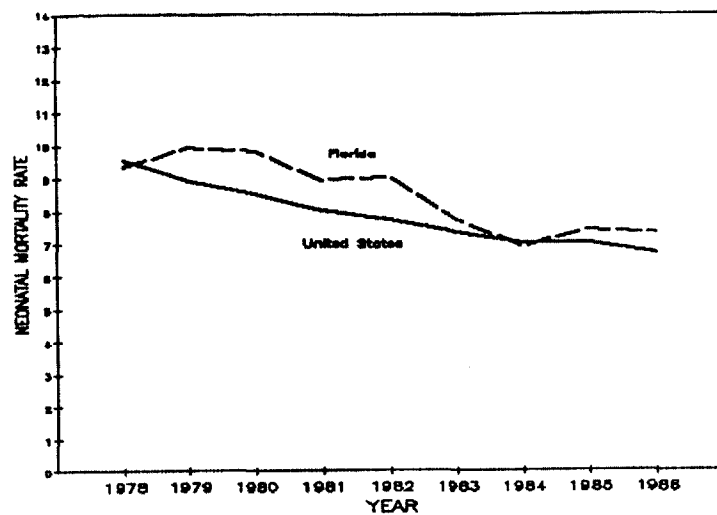


TEXAS

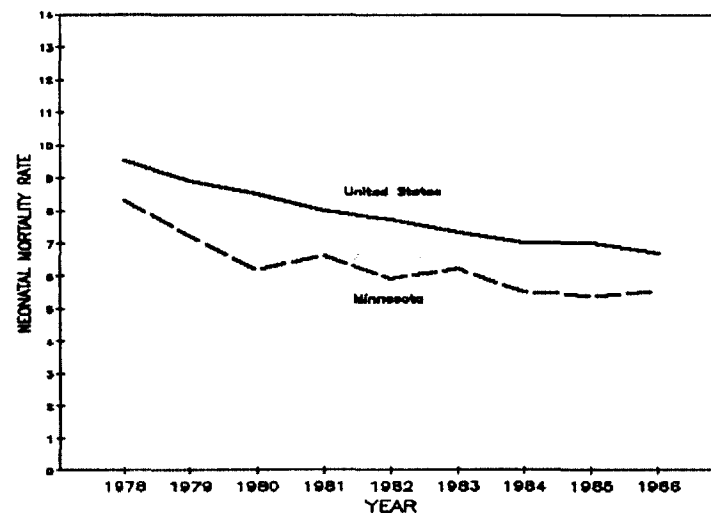


Neonatal Mortality Rates, All Races, 1978-1986
Participating States

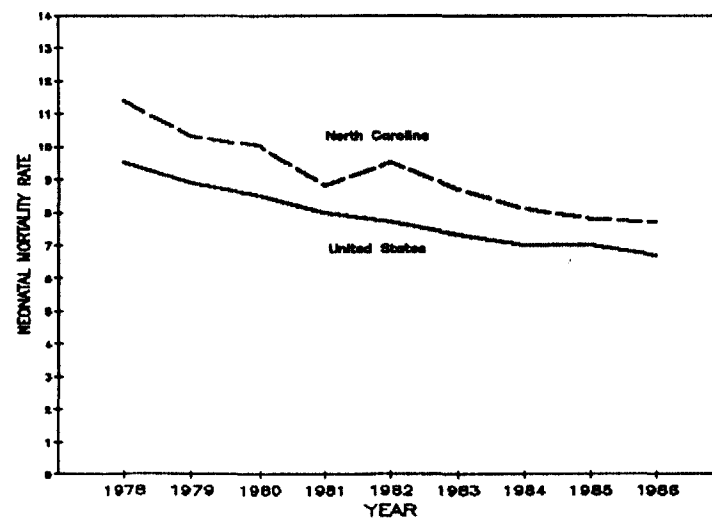
FLORIDA



MINNESOTA

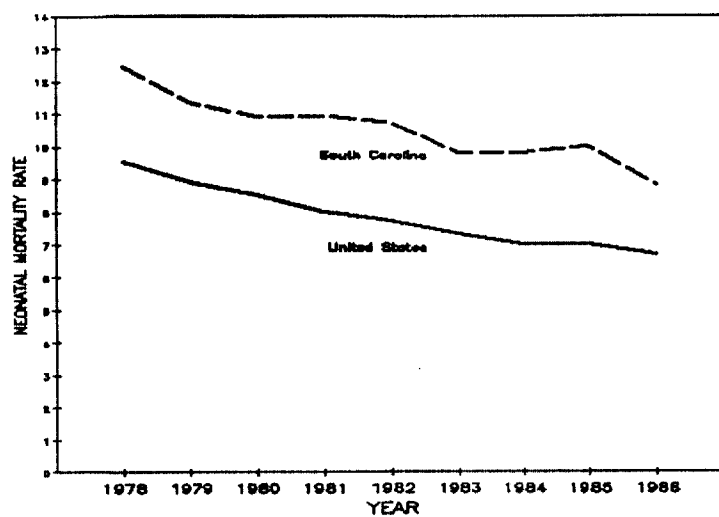


NORTH CAROLINA

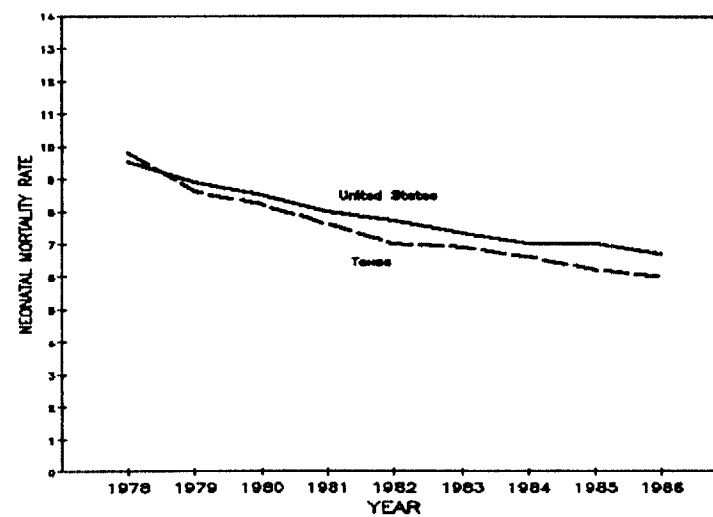


Neonatal Mortality Rates, All Races, 1978-1986
Participating States (continued)

SOUTH CAROLINA

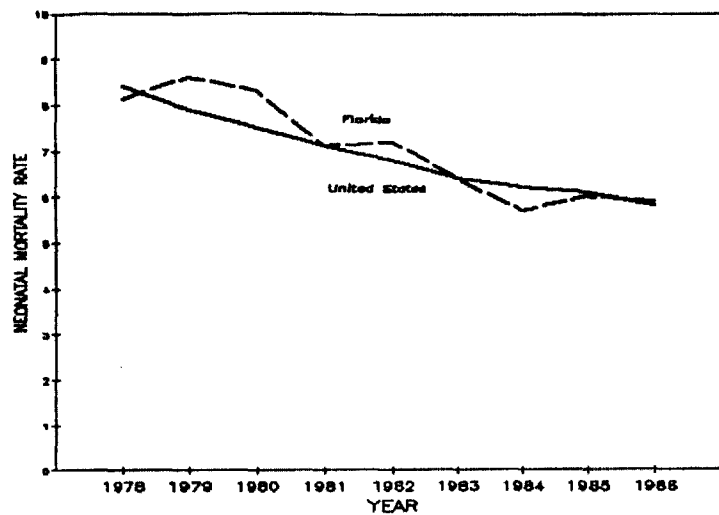


TEXAS

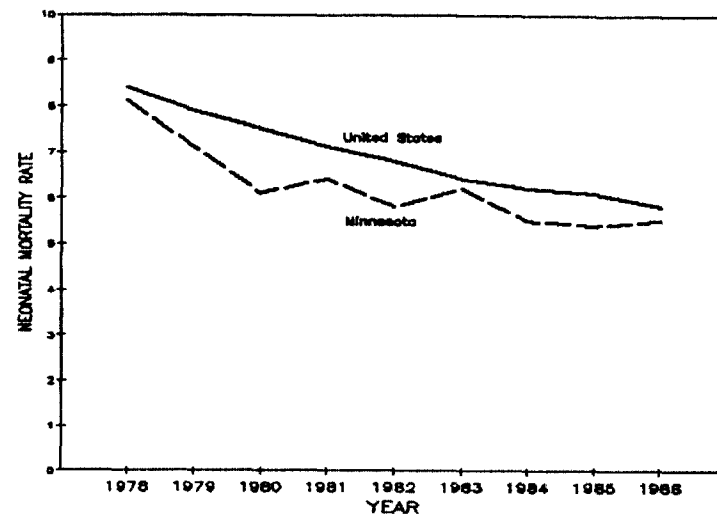


Neonatal Mortality Rates, White, 1978-1986
Participating States

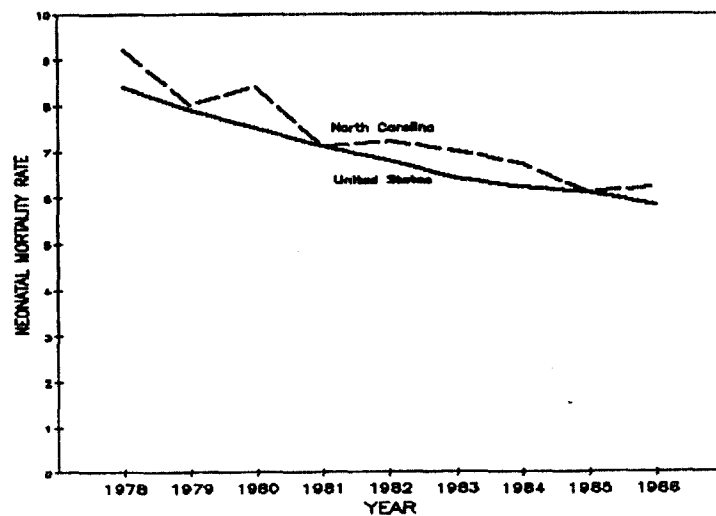
FLORIDA



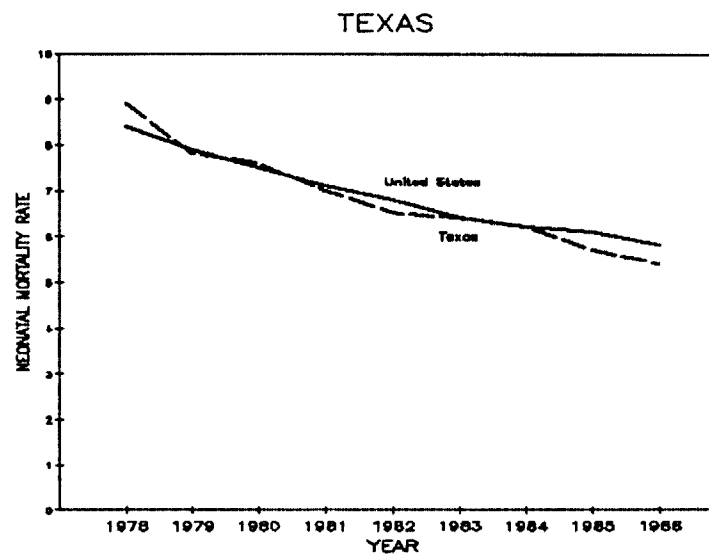
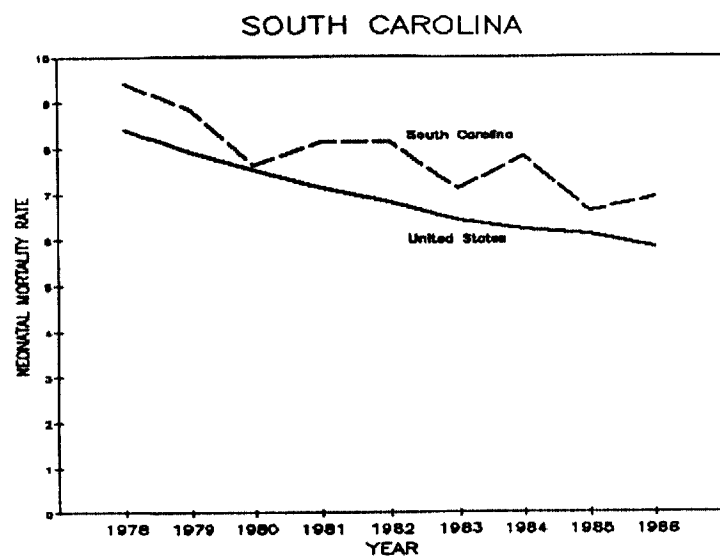
MINNESOTA



NORTH CAROLINA

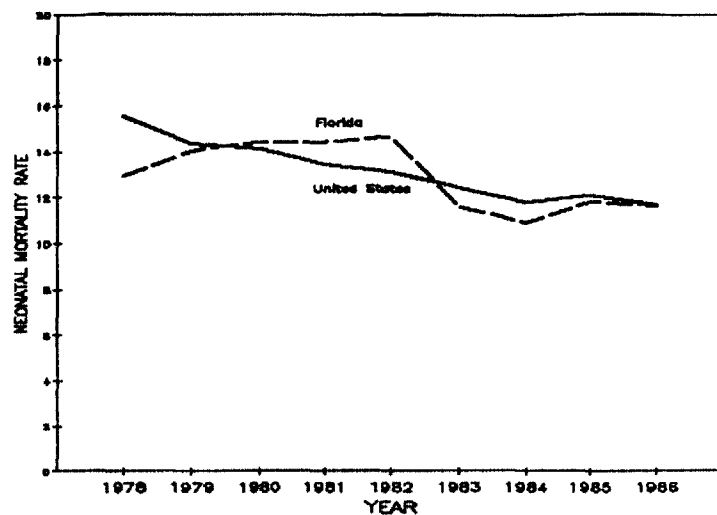


Neonatal Mortality Rates, White, 1978-1986
Participating States (continued)

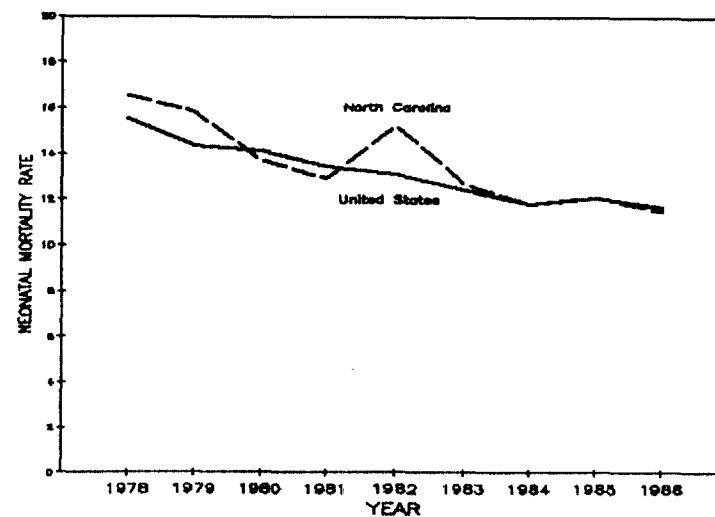


Neonatal Mortality Rates, Black, 1978-1986,
Selected Participating States

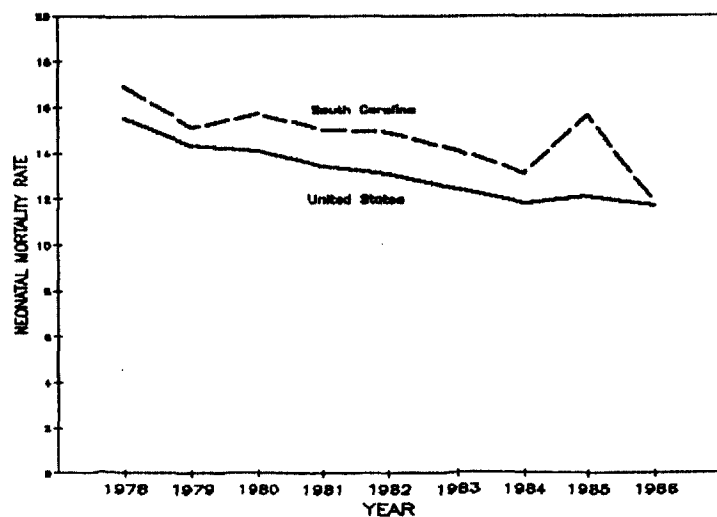
FLORIDA



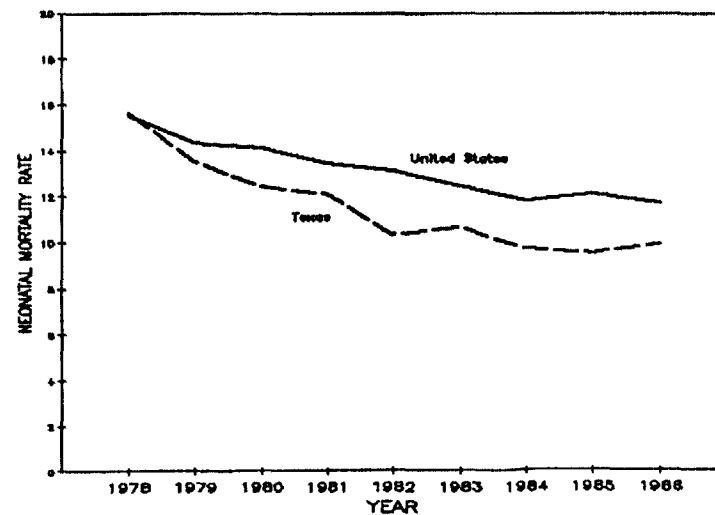
NORTH CAROLINA



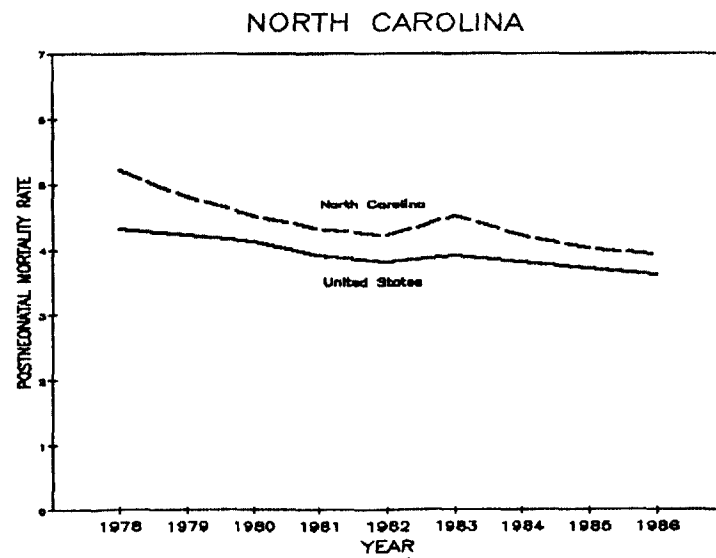
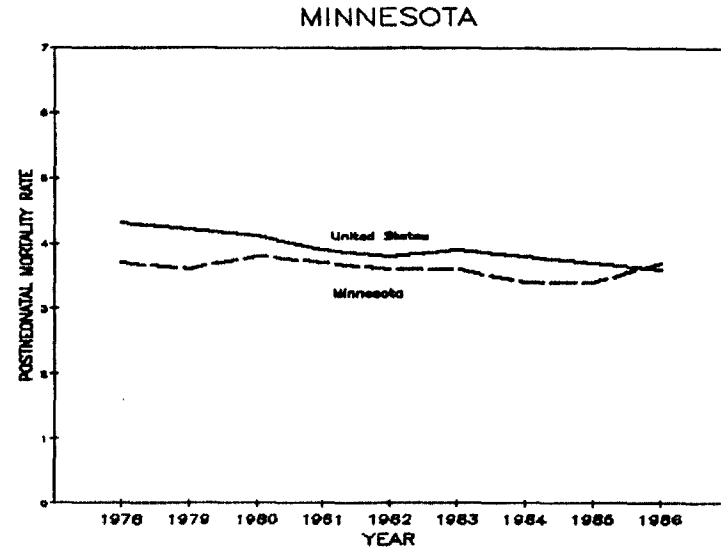
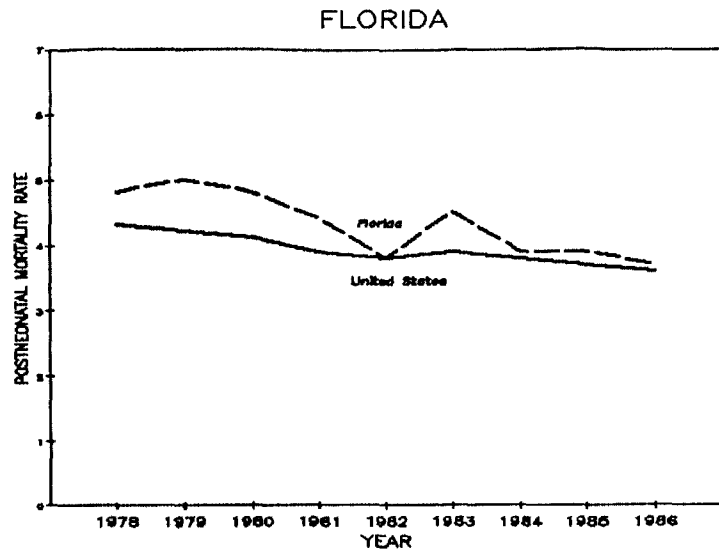
SOUTH CAROLINA



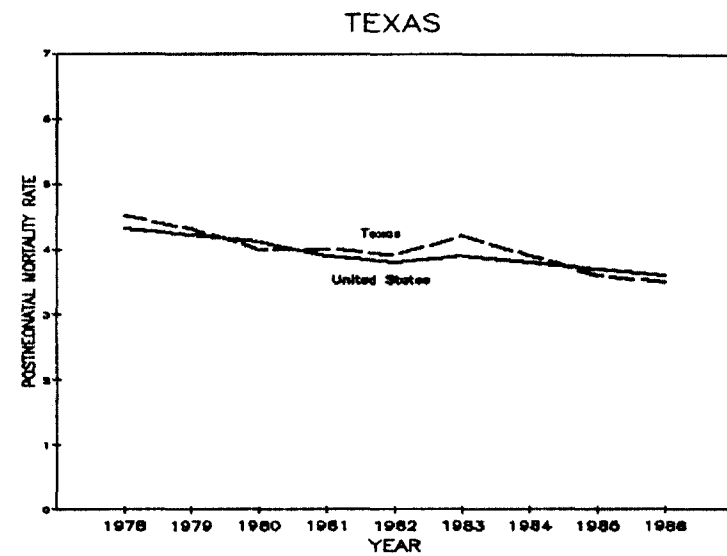
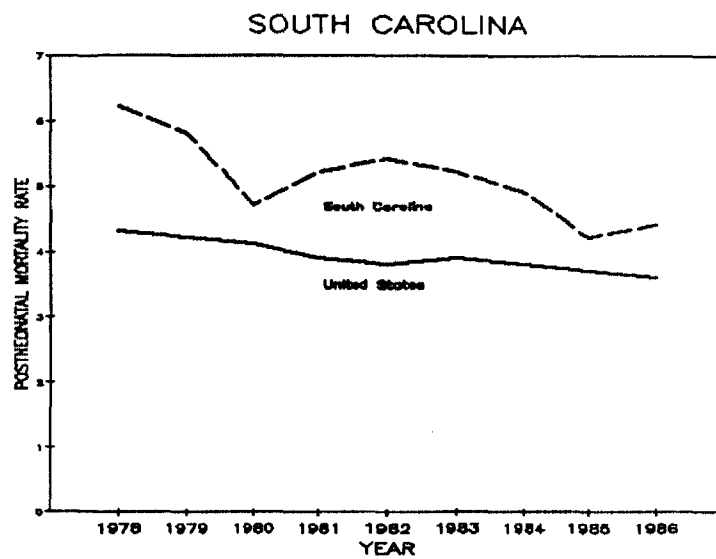
TEXAS



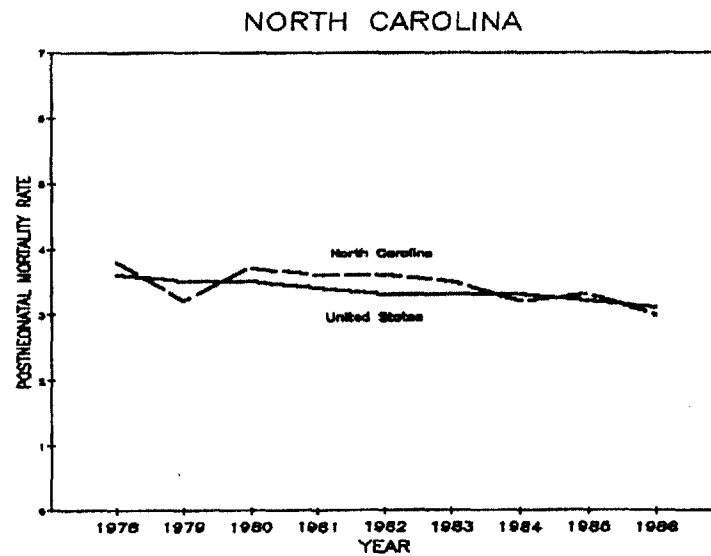
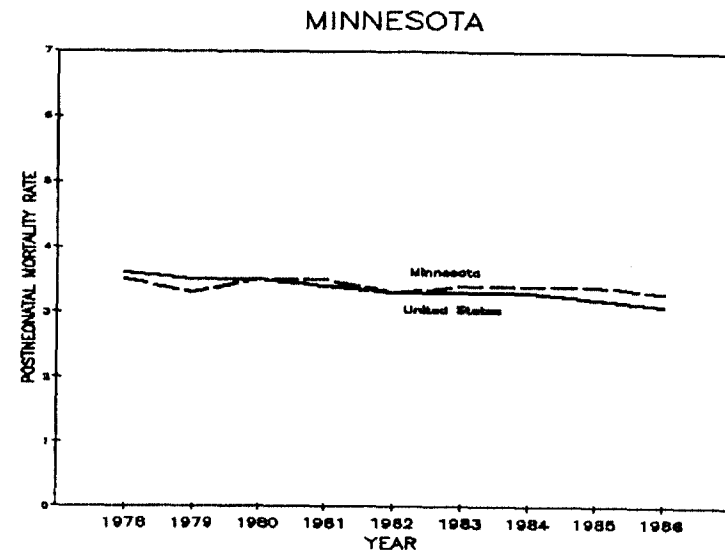
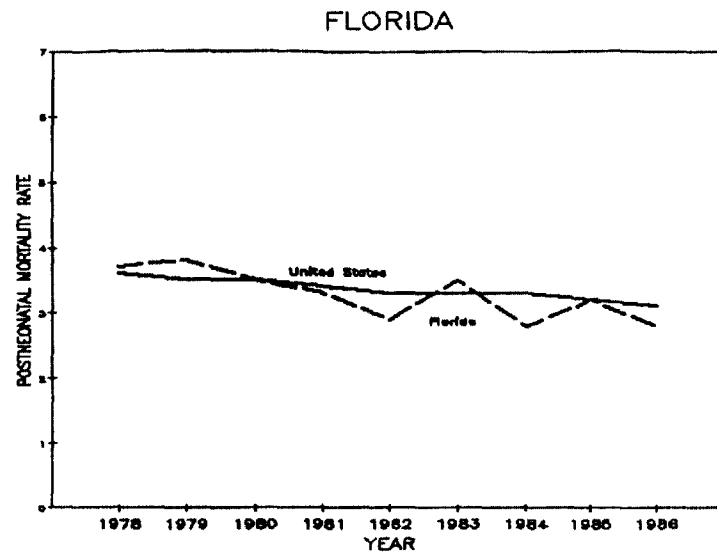
Postneonatal Mortality Rates, All Races, 1978-1986
Participating States



Postneonatal Mortality Rates, All Races, 1978-1986
Participating States (continued)

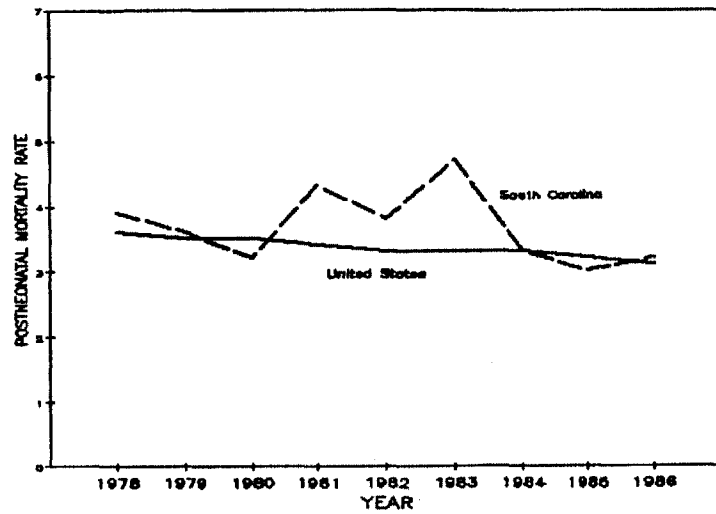


Postneonatal Mortality Rates, White, 1978-1986
Participating States

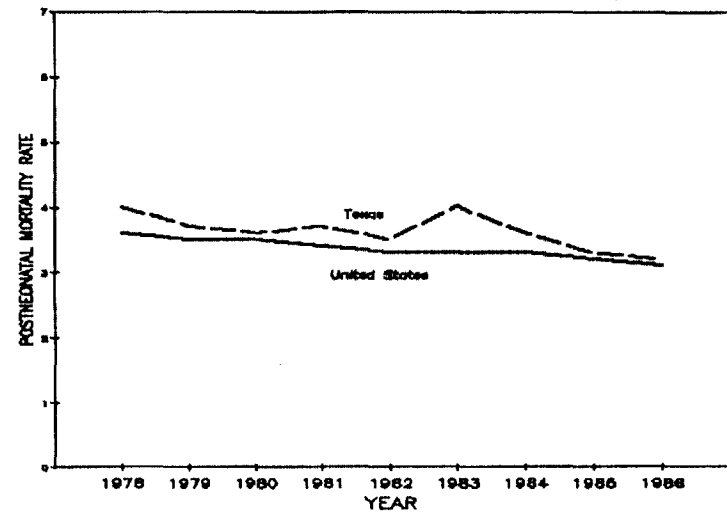


Postneonatal Mortality Rates, White, 1978-1986
Participating States (continued)

SOUTH CAROLINA

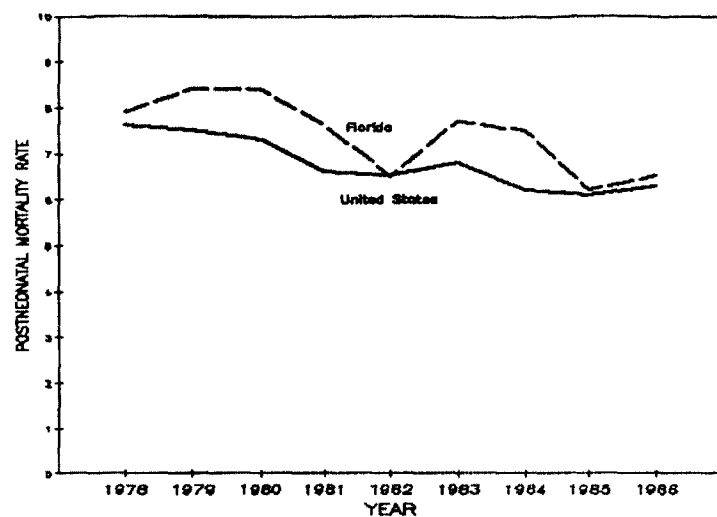


TEXAS

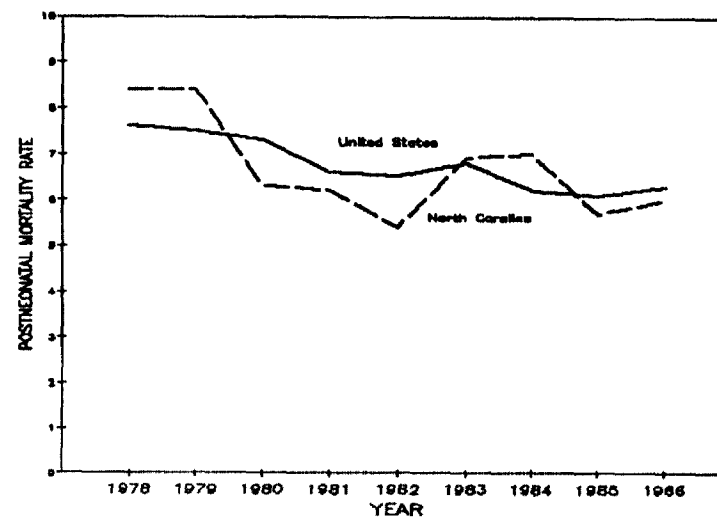


Postneonatal Mortality Rates, Black, 1978-1986
Selected Participating States

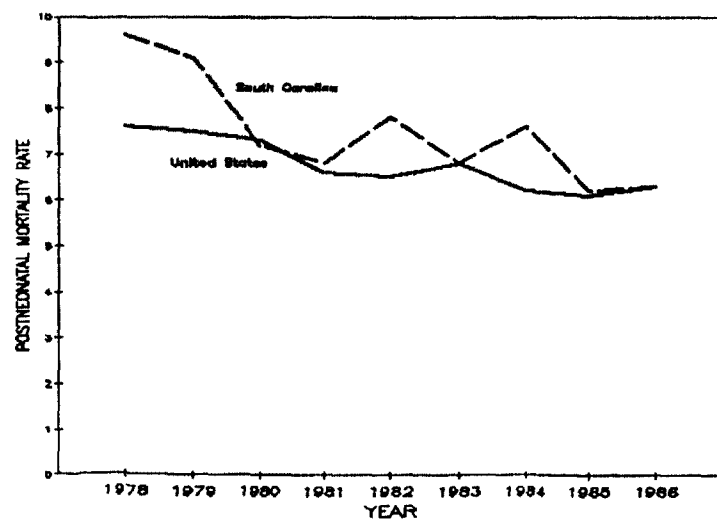
FLORIDA



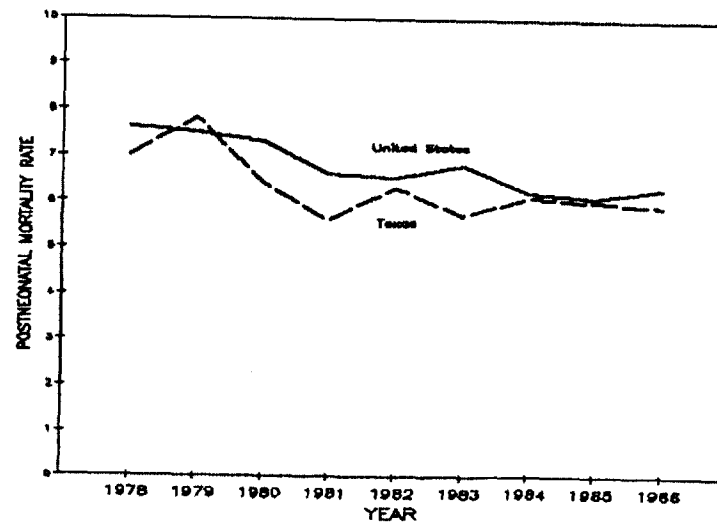
NORTH CAROLINA



SOUTH CAROLINA



TEXAS



MATHEMATICA
Policy Research, Inc.

P.O. Box 2393
Princeton, NJ 08543-2393
(609) 799-3535

600 Maryland Avenue S.W., Suite 550
Washington, DC 20024-2512
(202) 484-9220